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NOVEMBER 12, 1942

The IRON AGE

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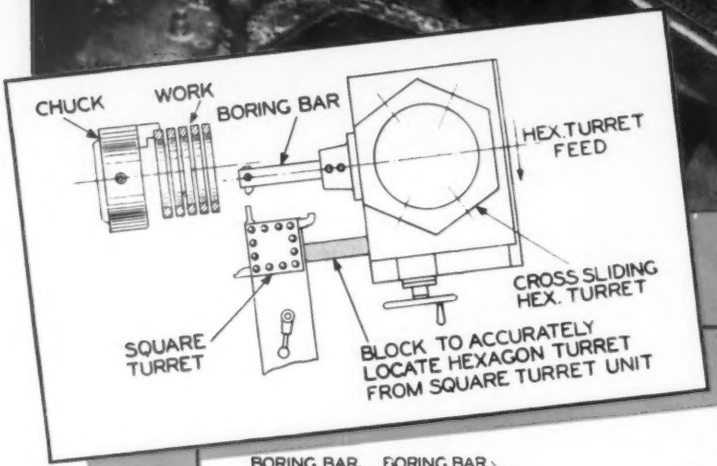

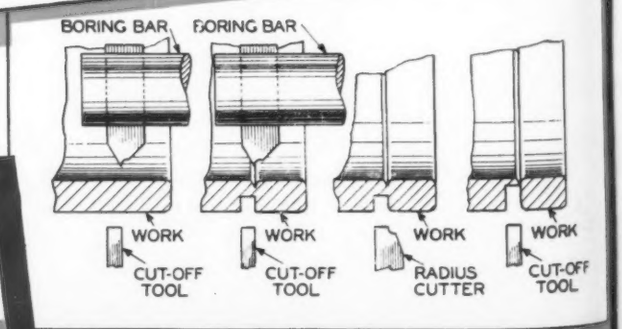

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NOVEMBER 12, 1942
VOL. 150, NO. 20

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Member, Audit Bureau of Circulations
Member, Associated Business Papers
Indexed in the Industrial Arts Index. Published every Thursday. Subscription Price North America, South America and U. S. Possessions, $8; Foreign, $15 a year.
Single copy, 35 cents
Cable Address "Ironage N. Y."

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Owned and Published by
CHILTON COMPANY
(Incorporated)

Executive Offices
Chestnut and 56th Sts.
Philadelphia, Pa.
U.S.A.

Editorial and Advertising Offices
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New York, N. Y.
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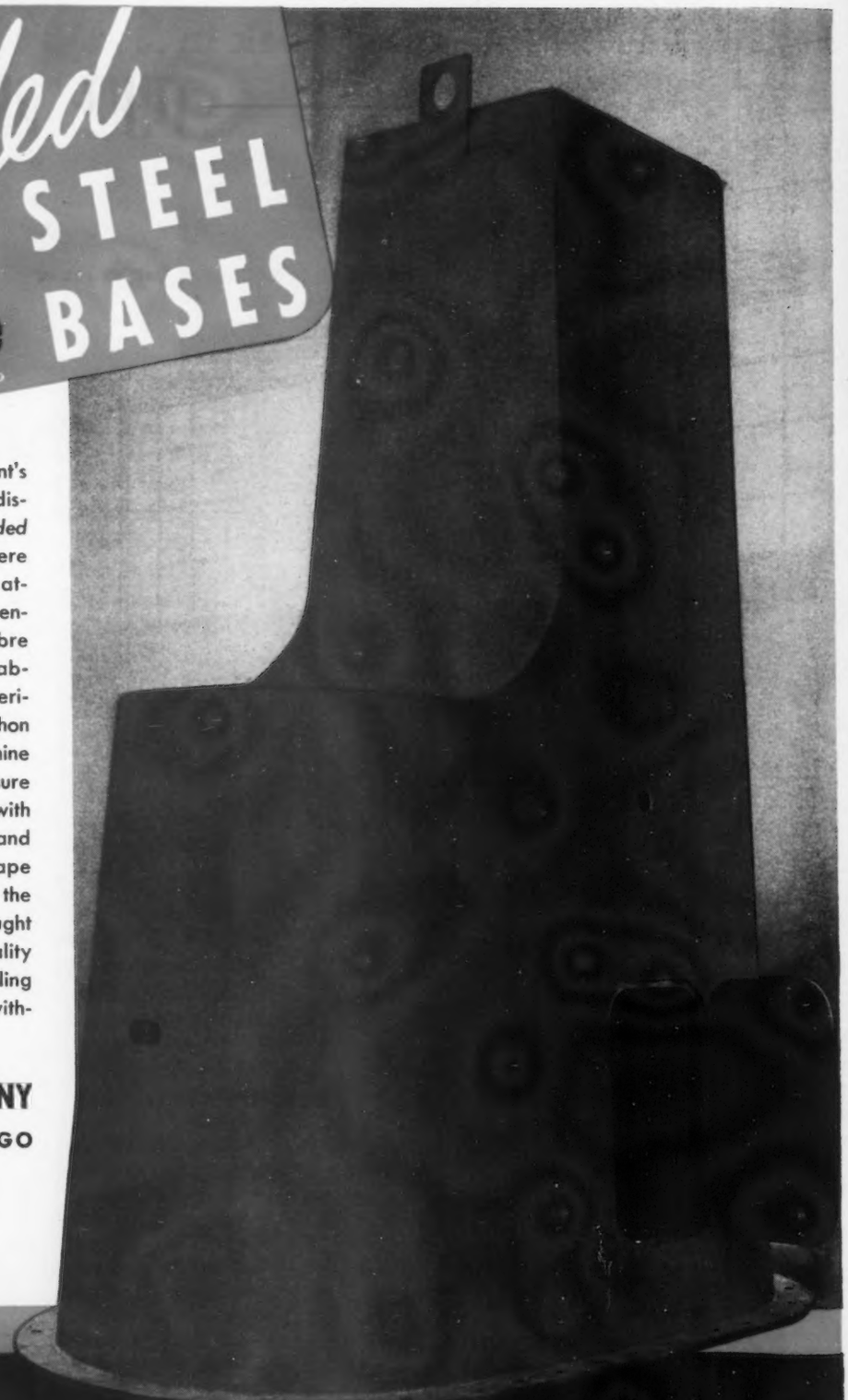
Welded STEEL Machine BASES



IN compliance with the government's request, we are not privileged to disclose the nature of this massive *welded* base—nor its use. It is exhibited here solely for the purpose of focusing attention upon the character of work entrusted to Mahon and the high calibre of craftsmanship that goes into its fabrication. When you call on the experience and resources of the Mahon organization to build your machine bases and frames, you can be sure your blueprints will be followed with exacting attention to each detail and dimension, regardless of size, shape or design. With full allowance for the greater demands the war has brought about, this strict adherence to quality is largely responsible for the doubling and tripling of Mahon production within the past few months.

THE R. C. MAHON COMPANY

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Manufacturers of Welded Machine Frames and Bases and Many Other Steel Products.

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MAHON

THE IRON AGE

NOVEMBER 12, 1942

ESTABLISHED 1855

The Sad Case of Bertha Jones

THERE was an old play, patronized by our forefathers, called "Bertha the Sewing Machine Girl."

In this drama, or rather, melodrama, the heroine is beset with difficulties. So much so that at the mellowist part of the mellowdrama, she utters the never-to-be-forgotten words: "God help a working girl on a night like this!"

What happened to Bertha after this ejaculation I do not remember, for this play was staged before my time and therefore probably before yours. I hope, however, that everything turned out all right for Bertha and all wrong for the villain.

I hope too, that things will turn out all right for our modern Berthas; the white collared clerical workers who now come under the ukase of our economic dictator, Mr. Byrnes, who has decreed that all increases in salaries for our clerical workers, men as well as women, must be approved by the War Labor Board.

Poor Bertha Jones, and poor War Labor Board! God help them both on a day like this: For both of them are going to have their full share of trouble.

You probably have some of these white collared workers in your organization. Some of them are beginners who have been with you for six months or more and who have made good in their jobs. Others are those who have had longer service and have had new responsibilities imposed upon them.

You would like to keep these people. But to keep them, you must, from time to time, increase their wages as their ability and responsibilities increase. Otherwise somebody else will grab them off, and perfectly legally, at a starting salary equivalent to what they should now, because of their added experience, be getting from you.

So your recourse, apparently, is to submit these requests for deserved increases to the War Labor Board. And this, too, is the recourse of thousands of other concerns who are not seeking for horizontal increases, such as the CIO and the AFL have so readily obtained, but for a few dollars a week or a month in individual cases. It seems to me that the War Labor Board has too much to do to wish upon it the job of determining whether Bertha Jones, a clerk in the XYZ Co., is or is not entitled to a raise of 75c. a week. Certainly the board has had its hands full in adjudicating right from wrong, or vice versa, in such cases as U.A.W. versus General Motors or U.S.W. against Little Steel. How it is to have the time to handle these big horizontal cases involving millions of dollars a year and take on the little individual cases of the white collared clerks who deserve a raise and who do not pay dues to a union is a moot question.

To relieve this situation for both the War Labor Board and Bertha Jones, why not empower employers to grant such increases as are deserved in their judgment and in individual cases, up to a limit of 15 per cent above the pay received for the same work 12 months ago, without submission to the War Labor Board? After all, white collared workers are people and are entitled to the same treatment that the board has given to organized groups.

Credit is given the Great Northern Railway for the illustration and theme of this advertisement.

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Steel cars and locomotives, traveling swiftly and safely on steel rails, are moving the greatest volume of traffic in the history of our nation. This is the war job of the American railroads—a job already 60% greater than in World War I and handled by 39% fewer locomotives and 17% fewer freight cars.

This inspiring railroad performance is made possible by foresight of railroad management, alertness of railroad operators, cooperation of American shippers—*and by steel on steel.*

In the days before all-out war effort, Inland helped the railroads prepare for the present emergency by supplying large tonnages of sheets, plates and shapes—special low-alloy, high-strength steels—and rails made by the control-cooled process. These Inland products helped build more powerful locomotives; freight cars with less dead weight, higher payload capacity, and longer service; and tracks that are safer for higher speeds and heavier traffic.

Yes, it is *steel on steel* that is carrying more than two-thirds of the nation's traffic, the greatest of all time—the railroads' part in winning the war.

Let us all do our part in releasing cars quickly so the greatest possible use can be made of all railroad equipment.

Dedicated to Victory

INLAND STEEL CO.

38 S. Dearborn Street, Chicago • Sales Offices: Milwaukee, Detroit, St. Paul, St. Louis, Kansas City

Effect of Moisture in Blast Air

By R. J. COWAN
Surface Combustion Corp., Toledo

. . . With renewed interest being shown in the removal of moisture from the blast air in blast furnaces, cupolas, open hearths and bessemers, this article is especially timely. In this, the first of a two-part article, the author reviews some of the basic conceptions of combustion, with particular reference to cupola operation, and traces the development of thought on moisture control. The little understood effect of hydrogen in the blast is covered, and specific examples of the influence of moisture content are given.

THE unrelenting demands of the war effort for iron and steel have placed a tremendous burden upon the nation's open hearths, blast furnaces and cupolas. As a means of increasing the productive capacities of these units, and for obtaining higher quality metal, attention has been directed to more exact control of the moisture content of the air blast required in operating such equipment.

In metallurgical operations where a carbonaceous fuel is brought into direct contact with the material being treated and to which the fuel supplies heat by combustion with the air, the importance of controlling the moisture content of the air has long been recognized, and the problem of controlling this moisture content has required the development of equipment which will give close and flexible control over the moisture and which will be capable of handling large volumes of air on an economical production basis.

An effective answer to these requirements has been found in the development in recent years of a chemical system utilizing lithium chloride* as the moisture control medium. This system has proven sufficiently flexible and effective for applications common in the iron and steel industry. A typical installation for handling cupola blast at 8000 cu. ft. per min., is shown in Fig. 1.

There are four types of metallurgical operations that can be directly benefited by controlling the moisture content of the blast: The blast furnace; the cupola; the bessemer converter and also, for special reasons, the open hearth furnace. In each case air is used principally for the oxygen it contains, since this reacts with carbon to cause combustion and the liberation of the large amounts of heat upon which the operation is dependent.

In the blast furnace and the cupola, the carbon is present in the form of coke, but in the bessemer converter carbon is only one of the constituents removed, along with others, from combination with the iron. At the same time, the combustion of these materials supplies the temperature necessary for reaction.

In these processes, although air is used principally for its oxygen content, it is a matter of common experience that fluctuations occur in operating these units which are not due to oxygen alone. It has been noted that these differences occur largely between wet days and dry days and between summer and winter.

As long ago as June 11, 1800, the following notes were made in a paper by Dawson: "In the summer season we all know that the furnaces never work quite so well as at any other time. A change from dry to moist air has sometimes reduced our charges four or five in 24 hr., and changed the metal from rich No. 1 to very indifferent No. 2."

In this quaint language is pointed out the fact that the melting rate is lowered and the metal quality changed by an increase of moisture in the air blast.

Incidentally, this paper by Dawson is of such historic importance that it was reprinted by the British Iron and Steel Institute in 1907. These variations which Dawson noted are traceable directly to the moisture content of the air, and this

* *See* THE IRON AGE, *July 30, p. 102, for description of Kathabar and other moisture removal systems.*

has been so well recognized that in many cases it has become customary to make periodic moisture determinations to serve as a basis for altering operating procedure. In one plant known to the writer, the amount of coke used in the cupola charge was changed from time to time on the basis of hygrometric readings that were made hourly. On the basis of experience, certain arbitrary standards had been set up to stabilize the operation of this cupola and make it independent of the weather.

It is now proposed to make use of moisture control equipment to accomplish this stabilization and supply air of a definite moisture content to the cupola.

Stabilization Required

The percentage of moisture that is to be maintained is determined by the product that is being made and the physical properties that are desired in the metal. A stabilized operation of this kind will result in the saving of considerable coke, will eliminate the necessity for periodic moisture determinations, and will improve the physical properties of the metal. These points will be discussed later in this paper.

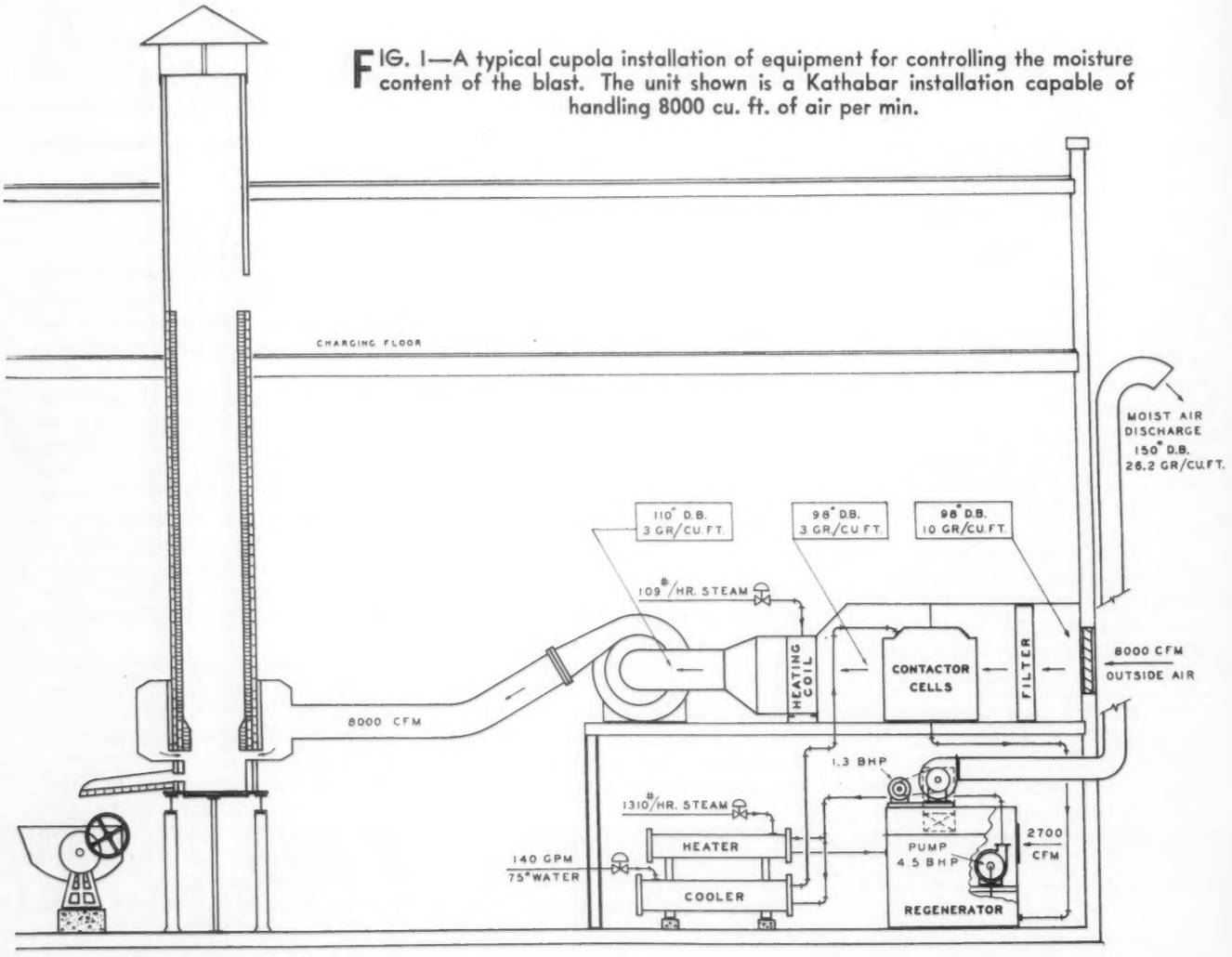
On first consideration it might appear that the effects of moisture in the air could be eliminated by the use of coke. If such were attempted, the oxygen of the water would combine with the carbon of the coke, and at the high temperatures involved would simply take part in the combustion reactions. In this respect the use of water would replace air in the usual combustion process. This viewpoint seems to be very widely held in the industry since it is common practice to use coke to overcome moisture.

It must be stressed, however, that in addition to those reactions which take account only of the oxygen content involved, hydrogen is also liberated from the water and of itself this will have far-reaching effects upon the physical properties of the metal. This does not take into consideration the fact that a high temperature is required to bring about the reaction between water and coke and that additional coke is required to maintain the temperature of the operation. This will be noted in terms of practice when it is recalled that steam is used in certain combustion operations to hold down the high temperatures that would otherwise result.

In metallurgical operations being considered here first (the cupola and blast furnace) the chemical constituents of the water are liberated under conditions of extreme reactivity and in direct contact with liquid iron. It is a well known fact that when a chemical compound such as water breaks down, the constituents of which it is composed are at that moment extremely reactive and enter easily into combination with other chemical elements in the vicinity where the reaction is occurring.

In blast furnace operation, the

FIG. 1—A typical cupola installation of equipment for controlling the moisture content of the blast. The unit shown is a Kathabar installation capable of handling 8000 cu. ft. of air per min.



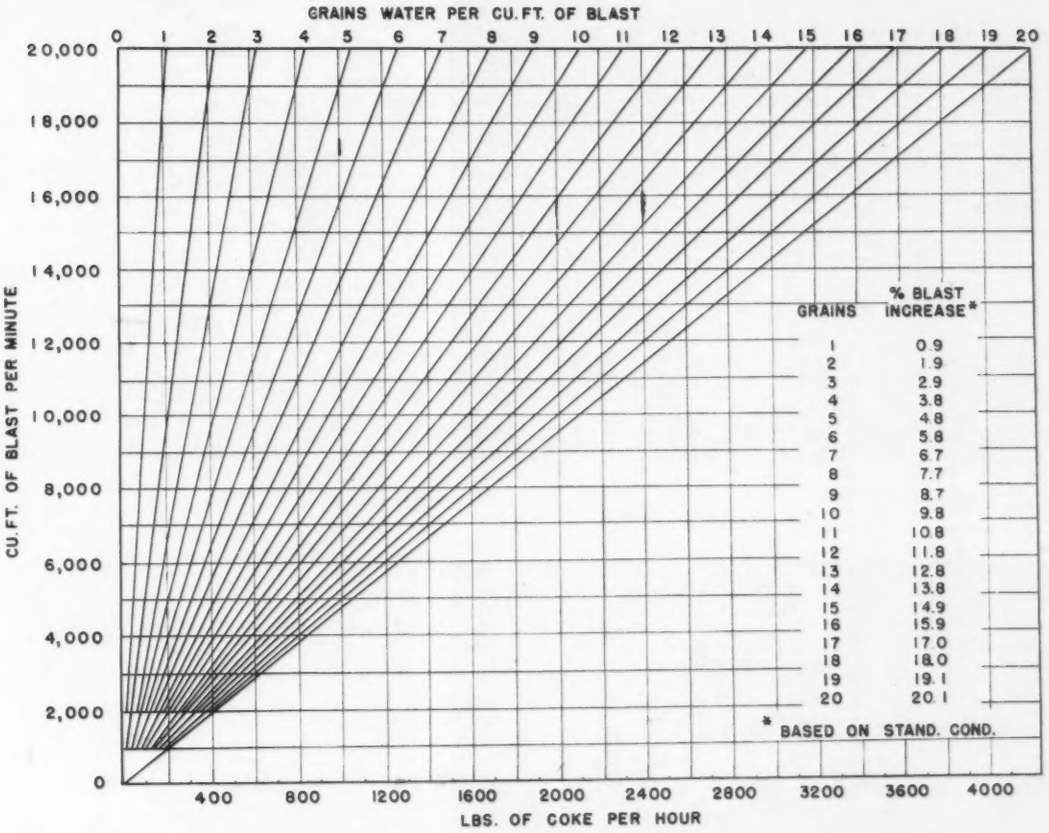


FIG. 2—Effect of moisture on coke consumption. This chart shows the amount of coke which must be added to the base charge to compensate for a given increase in the moisture content of the blast.

moisture which enters the furnace with the blast through the tuyeres reacts with carbon and liberates hydrogen at the ideal point and in an ideal condition to be absorbed by the liquid iron which at this moment has reached its maximum temperature.

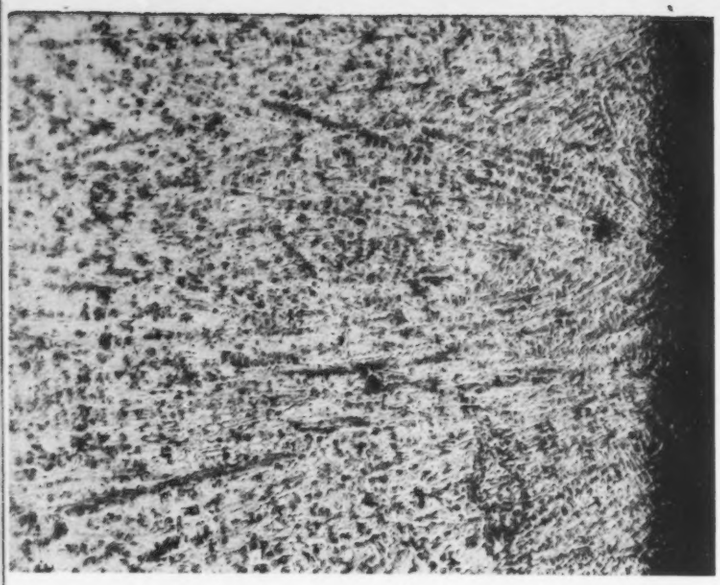
Types of Moisture

The moisture that is introduced in this manner must not be confused with moisture introduced in the solid charge of the furnace as damp coke or other materials of the burden. In this latter case, the moisture enters the furnace at the top and is driven off at a low temperature with the top gases while the charge is being heated.

The moisture which enters the tuyeres of the blast furnace, however, is in an ideal form and at the ideal spot for adding hydrogen to the melted iron. The same thing may be said in regard to cupola operation. In the case of the operation of the bessemer converter, it becomes apparent at once that the intimate contact which is afforded there between masses of melted iron and large volumes of air which are blown through the iron, provides an excellent means for introducing hy-

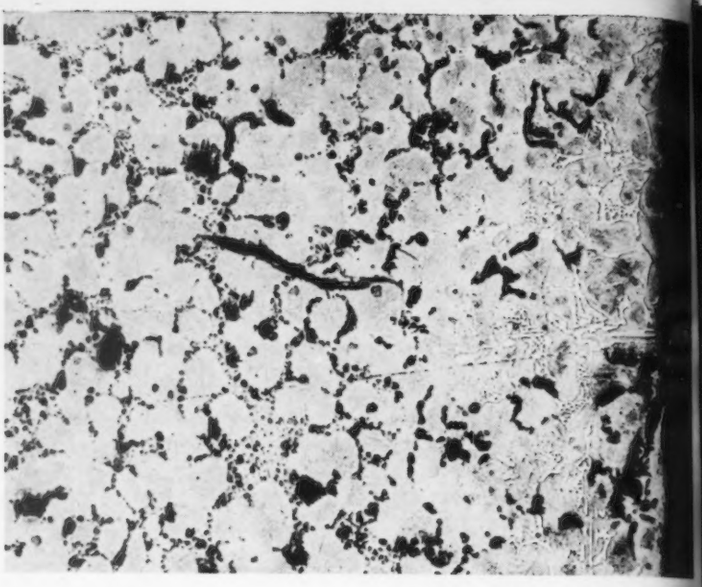
1.5 Grains per cu. ft. | 10.4 Grains per cu. ft. | 21.2 Grains per cu. ft.

FIG. 3—Effect of moisture on depth of chill in cast iron. These specimens are from the respective heats tabulated in Table I.

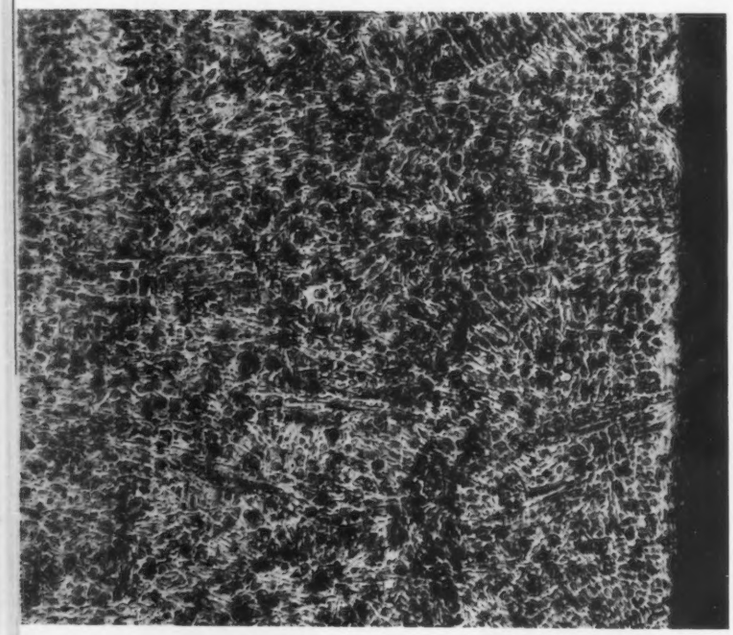


Chilled Face

1.49 GRAINS OF WATER PER CU. FT.

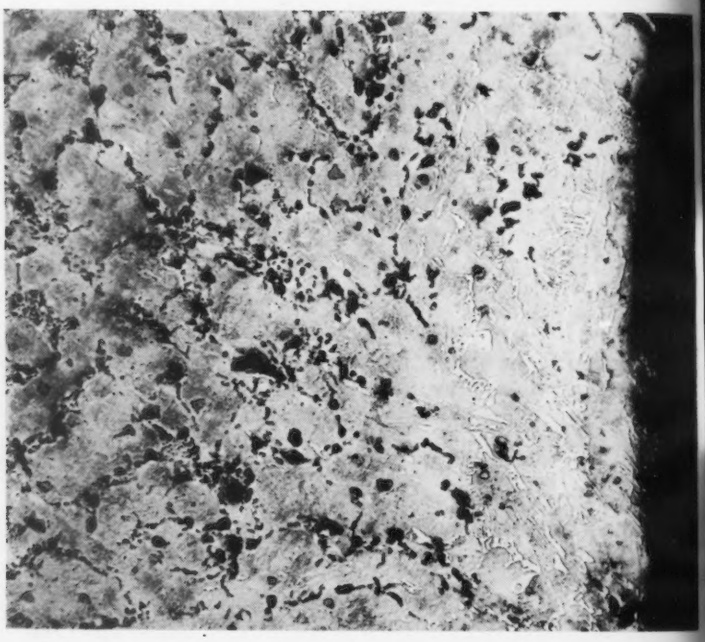


Sand Cast Face

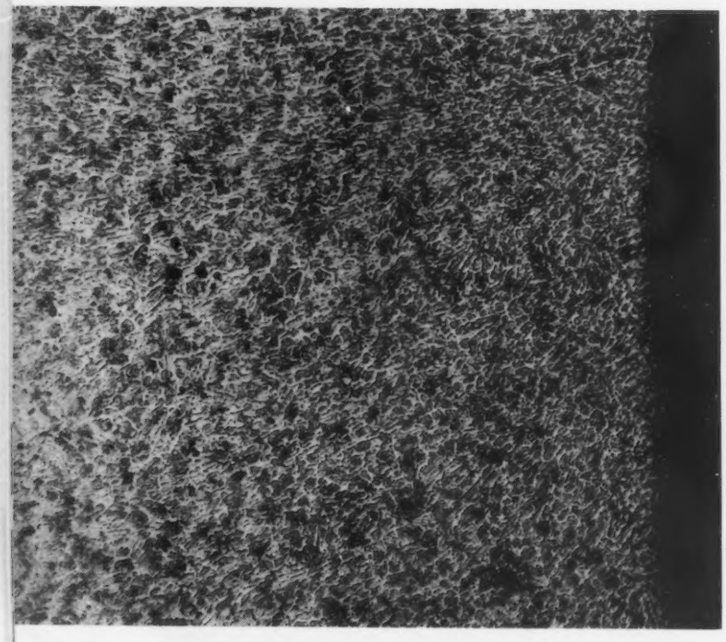


Chilled Face

10.4 GRAINS OF WATER PER CU. FT.

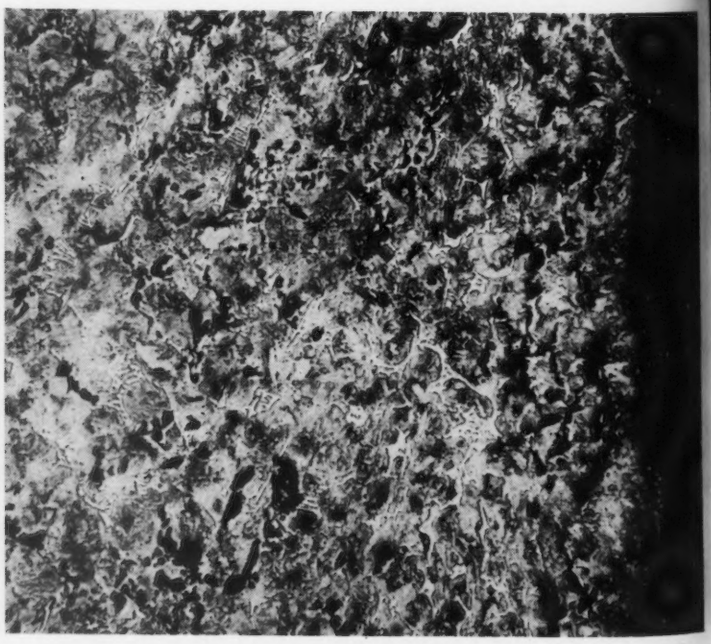


Sand Cast Face

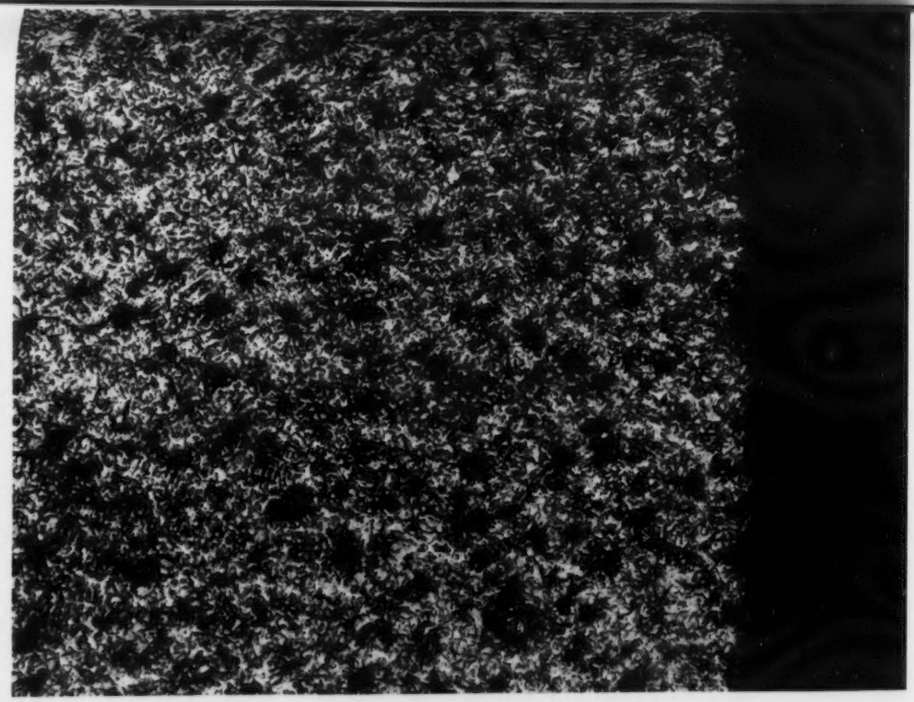


Chilled Face

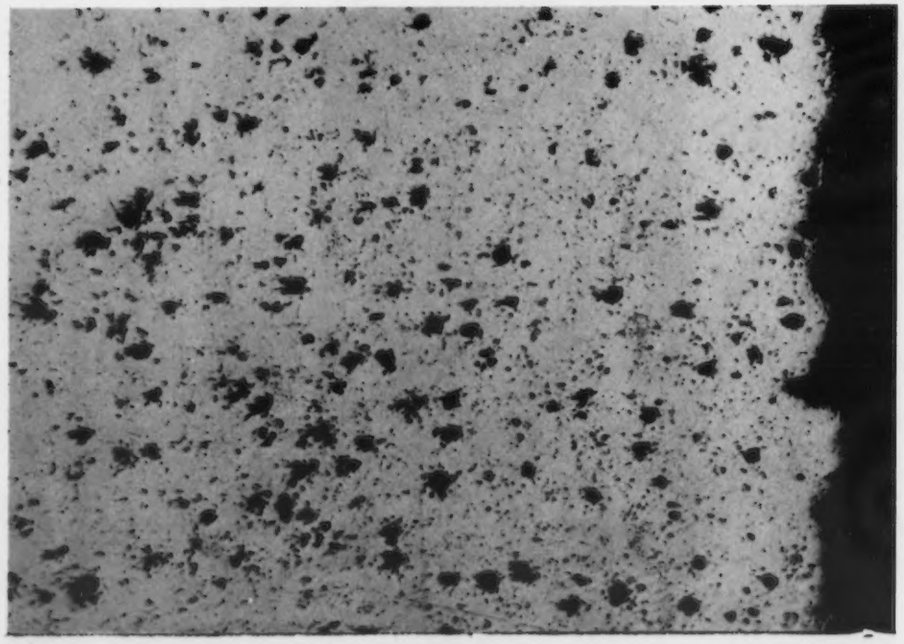
21.2 GRAINS OF WATER PER CU. FT.



Sand Cast Face



3 Grain Moisture



3 Grain Moisture

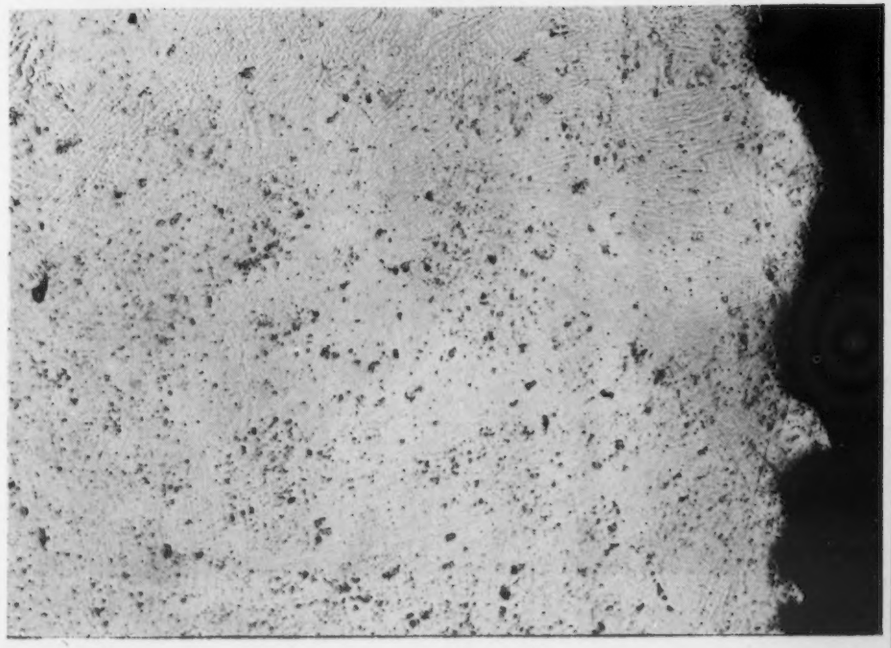
FIG. 4—Effect of small amounts of moisture in the blast upon the cicrostructure of gray iron. These micrographs (100 ff diameters) are from the chill blocks shown in Fig. 3 and analyzed in Table I.

←ETCHED→

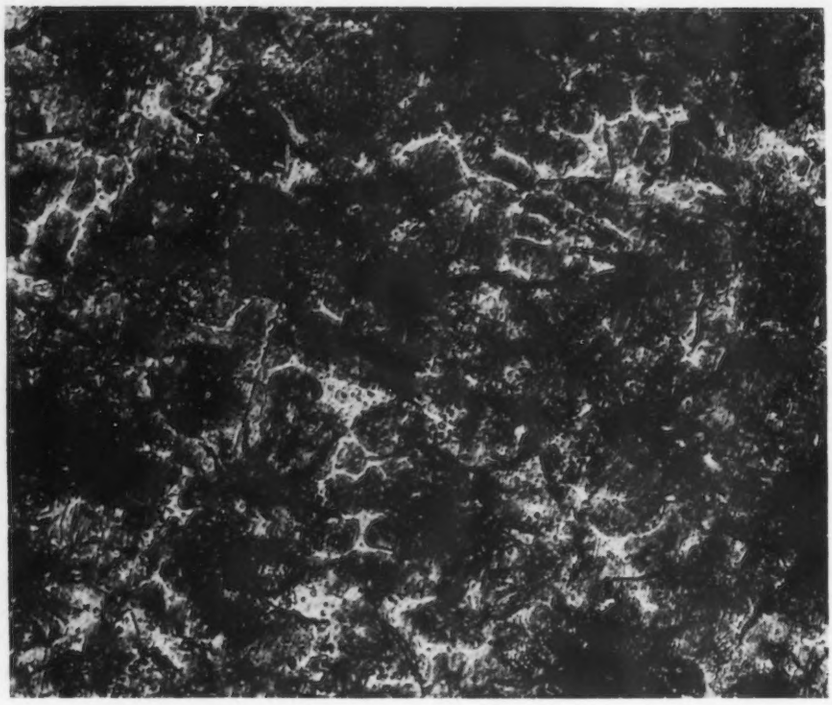
FIG. 5—Structures of piston ring iron (100 diameters) which had a tendency to become white and hard as the moisture content of the blast increased. Upper two micrographs are etched, lower two are unetched.

←UNETCHED→

10 Grain Moisture



10 Grain Moisture



3 Grain Moisture

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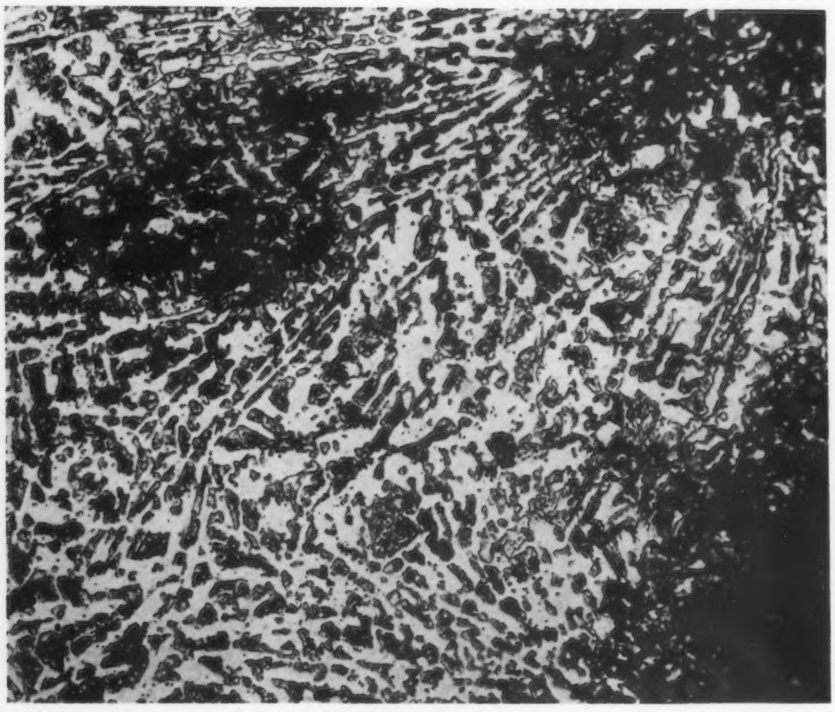


10 Grain Moisture

Fig. 6—Detail (500 diameters) of the edge of the iron shown in Fig. 5.

drogen into the metal from the moisture contained in the blast.

The use of dry blast in connection with the operation of blast furnaces and cupolas is not new; it has been used in this country and abroad in a number of plants. A considerable fund of literature has accumulated on this subject through the years and many claims have been made which have been found to be extravagant.

In 1904, James Gayley built the first refrigerating plant to freeze the moisture out of the air for the blast in one of the Isabella blast furnaces of the Carnegie-Illinois Steel Corp. at Etna, Pa. Following this, some 10 installations were made in various parts of the country. Installations were also made in Germany and England, but the results obtained at that time were such that practically all these plants were finally dismantled.

In each of these cases, the moisture in the air blast was removed by refrigeration in the form of ice and consequently involved the removal of from 30 to 50 tons of ice for each 24 hr. operation. There seemed to be no question but that coke was saved in blast furnace operation and that the furnaces were made to operate more smoothly by this treatment. The principal drawback appeared to be the mechanical operation of the refrigerating equipment and the difficulty of obtaining uniform and consistent operation.

A number of installations for drying cupola air have been reported. In each case the results obtained have shown an improvement so that their use has continued throughout the years, although the idea has not taken hold in the industry at large. The reason for this is to be found, as in the preceding case, in the type of equipment available for this work. Blast moisture control, as applied to the operation of a bessemer converter, is believed to be a new thought arising from a consideration of the presence of hydrogen in this metal.

A possible fourth application concerns the open hearth for steel making. There is sufficient evidence to show that hydrogen in steel is traceable to the melting operation. This matter will be considered more fully later in this paper.

Returning to a more detailed consideration of these processes, the use of a blast of air of which the moisture content is controlled within definite limits and moisture composition uniformly maintained, regardless of atmospheric conditions, will be described as it applies to these processes in the order named, first the cupola for the manufacture

of gray iron, then the blast furnace, the bessemer converter and the open hearth furnace.

Cupola Operation

It is a matter of common knowledge that the operation of a foundry cupola is dependent upon the weather. If the day be a dry one, the air entering the cupola will be low in moisture and this will have a beneficial effect upon the operation. On the other hand, if the moisture content of the air is high, the operation of the cupola is adversely affected. These facts in themselves are responsible for many of the ups and downs encountered in cupola operation. During the winter time, the moisture content of the air is usually low and this checks with the common observation that the operation of these units is more uniform in winter than in summer.

During the summer season, the moisture content of air suffers a wide series of fluctuations that often occur rather suddenly and, at times, during the course of a single day. These changes often result in upsetting the cupola operation. This fact is so well recognized that it has become good practice in the operation of cupola plants to take periodic moisture readings of the air used in the blast. On the basis of this content an adjustment is made in the coke charge along with the necessary volume change in the amount of air used.

The procedure requires constant attention and supervision to insure satisfactory results. Thus, it is obvious that the best type of cupola operation is obtained under conditions that are maintained uniform at all times. When it becomes necessary to change any of the factors, such as air, fuel, burden, etc., the functioning of the cupola is altered and time is required to stabilize conditions on the new basis.

However, if these changes are made frequently throughout the run, as is sometimes found to be necessary when the moisture content of the blast varies, it is obvious that while the results may be kept satisfactory from the standpoint of metal quality this will have been accomplished at the expense of considerable adjustment. Always present is the danger of producing iron of intermediate or indifferent quality. In fact, these frequent adjustments are largely responsible for the production of off-quality metal.

TABLE I

Effect of Moisture on Chemical Analysis of Gray Iron

Heat No.	Grains of Moisture Per Cu. Ft.	Total Carbon	Combined Carbon	Mn	P	S	Si
17	21.2	2.64	0.95	0.70	0.136	0.163	1.42
18	10.4	2.92	0.82	0.83	0.144	0.162	1.58
28	1.5	2.99	0.71	0.79	0.122	0.144	1.77

Coke Consumption

The amount of moisture in the cupola blast affects coke consumption in a very definite manner, acting to increase coke requirements as the moisture content of the blast rises. This is shown graphically in Fig. 2. This chart, prepared by the Battelle Memorial Institute, shows the amount of coke that must be added to the base charge to compensate for a given increase in moisture content of the blast.

This chart is read in the following manner, assuming a cupola requiring 11,000 cu. ft. of air per min. If this air contains seven grains of water per cu. ft., coke to the amount of 800 lb. will have to be added to the base charge. If this blast contains 10.5 grains, 1200 lb. of coke will be required, in addition to the base charge.

The fluctuation of the moisture content of the air in actual practice can be very sharp. A variation of 6 to 10 grains per cu. ft. may be observed between different days and occasionally within the same day.

It is apparent from this chart that an increase in the moisture in the blast requires an increase in coke charges in order to maintain the metal temperature. This has a far reaching effect upon the entire operation. In the first place, it will supply additional carbon to react with the oxygen of the water and, since heat is necessary to produce this reaction, this will affect the temperature of the metal. The varied temperature, in turn, will alter the chemical composition of the metal being produced.

The effect of moisture upon temperature may be illustrated in many different ways. In the operation of the bessemer converter, steam is sometimes added to the air blown through the molten metal to hold down the temperature of reaction. And, in certain experiments in the melting of malleable iron, the effect of moisture added to the blast of a reverberatory furnace has served to lower the temperature of the resulting iron. The effect was the same when moisture was added to the coal used for fuel, either as additional moisture or as moisture locked in the structure of certain types of coal.

To illustrate the effect of moisture upon the chemical analysis of gray iron, the result of a run in a cupola in which all conditions were maintained constant, except the moisture content of the blast, is shown in Table I.

The table shows that as the moisture content increases, the total carbon content of the metal decreases, the silicon content decreases and the combined carbon increases considerably. These facts indicate that the iron has increased substantially in hardness. The effect of this upon the depth of chill is shown in Fig. 3, a photograph of the fractures of the iron covered in Table I. By actual measurement, the chill depth increased from 0.75 in. to 1.5 in. with the increase in moisture. The differences in the corresponding microstructures of this iron are shown in Fig. 4. These micrographs also provide a comparison between the sand-cast and the chilled face of the same iron bar.

The wide difference in these structures, as a result of the different moisture contents of the blast, is a clear illustration of the effect that moisture has on the operation of a cupola and the resulting product. Records show that the temperature of this metal was lowered, as a result of the increase in moisture content, from about 2580 deg. F. to 2480 deg. F. with the higher moisture value. This lower temperature affected the melting rate adversely.

In another case, a manufacturer

of piston rings found that the rings became white and hard when the moisture content of the blast increased above a certain minimum. The structures resulting in this case are shown in Fig. 5. The specimens at the bottom are unetched. A detail of the edge with the higher moisture content iron is shown at 500 diameters in Fig. 6. An increase in the moisture content of the blast from 3 to 10 grains per cu. ft. was sufficient to cause the difference in these rings shown by the micrographs.

It is not intended to convey the impression that variations of this kind are to be looked for in castings coming from gray iron foundries. The men who operate cupolas know how, by manipulation, to take care of these variables and it is a part of the art of cupola operation to detect as quickly as possible the adverse developments as they occur and to make adjustments necessary to compensate for them.

There are times, however, when this is extremely difficult and at all times its success is dependent upon the personal element, a most variable factor. These variations can be met and maintained in a far simpler manner by controlling the moisture content of the blast and holding it at a definite value which has been determined by experience. Such a procedure can be established very simply.

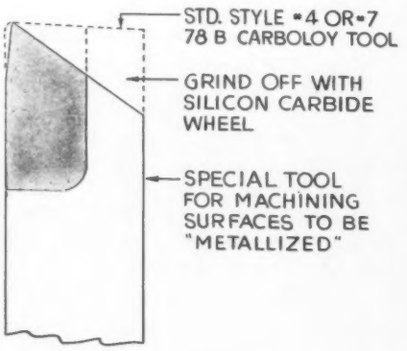
Editor's Note: Next week, in conclusion, the author discusses the effect of moisture in the air used in blast furnaces, open hearths and bessemers, with particular reference to the influence of hydrogen in high-moisture blast on the characteristics of iron and steel.

Roughening Surfaces for Metallizing

MOST types of sprayed metal do not form a chemical bond with the coated part, and to get good adhesion it is necessary to roughen the surface to secure a mechanical bond. Over the past year or two a number of tools were developed to roughen surfaces. They included specially knurled and dovetailed tools, and did a satisfactory job when the material was easy to machine and tool life was great enough to stand the relatively high cost. These special tools did not prove satisfactory, however, on alloy steels.

Engineers of the Carboloy Co., approached with the problem, came to the conclusion that while a correctly ground Carboloy tool will produce a smooth surface, an incorrectly ground one would produce the reverse. Selecting a style 4 tool from stock they ground it to the unorthodox shape shown in Fig. 1. Fig. 2 shows the results achieved by machining a piece of tough alloy steel, taking cuts of depths of 0.101, 0.015 and 0.020 in. respectively. The feed was approximately 0.030 in. Cutting speed was between 200 and 250 surface ft. per min.

The surface at the extreme right is that produced by the 0.020-in. depth, and was exactly what the metallizing men were looking for. In cutting, the "improperly" ground tool raised a burr between the tool marks, and the tool angle was such that the cutting tool pressure pushed the burr over into a horizontal position. The photograph, Fig. 2, and the sketch "C" in Fig. 3, show that the tool also lifts some of the crests intermittently, thereby producing a mottled surface that forms an ideal base for the adhesion of sprayed metal.



ABOVE

FIG. 1—Special tool for machining surfaces to be metallized, produced by unorthodox grinding of a standard Carboloy tool.

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RIGHT

FIG. 2—Alloy steel shaft ground experimentally to determine surface roughening effect of different depths of cut with a specially ground roughening tool.

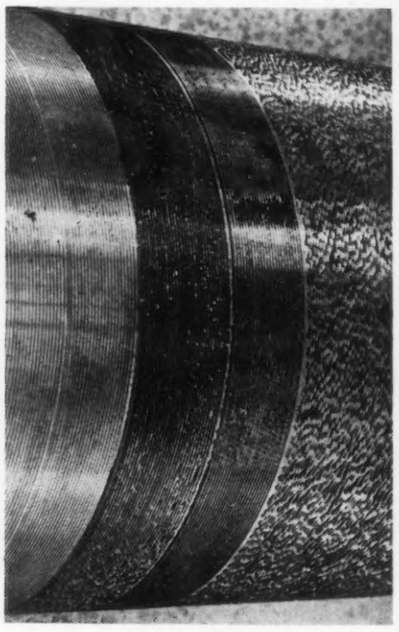

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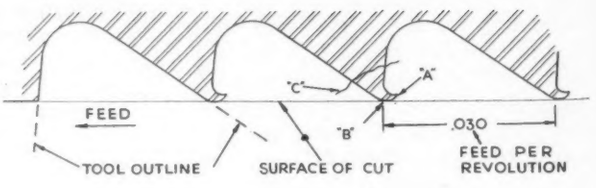
FIG. 3—Enlarged profile of 0.020-in. cut taken with the tool sketched in Fig. 1 shows how the surface is prepared for mechanically bonding a sprayed metal coating.



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Recovery of Gilding Metal from Clad Steel

. . . As the streams of bullets pour from the munitions factories, the pool of gilding metal clad scrap grows. It contains steel, zinc and desperately needed copper. This study, made at the request of the WPB, surveys methods and possibilities of recovering the metals in this pool of scrap.

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By A. J. THOMPSON

Battelle Memorial Institute and War Metallurgy Committee of National Academy of Sciences

TO save alloy, the Ordnance Department has decided to use a brass-clad steel for bullet jackets in place of the customary solid brass (gilding metal) formerly used.* The cladding will contain 90 per cent copper and 10 per cent zinc, the same as the solid gilding metal, and will amount to approximately 20 per cent of the weight of the material, the remaining 80 per cent being mild steel.

*See THE IRON AGE, *July 30, p. 85.*

In the production of the bullet jackets, considerable clad steel scrap will be produced; it is estimated that its production will amount to 11,000 tons a month by May of 1943, when maximum production probably will be reached. Part of this scrap will be steel-mill scrap; part will be webbing, and a lesser amount will be from cup-forming operations. Superior Steel Co., Pittsburgh, is already in production on clad jackets and has already accumulated a large tonnage of reject pieces. Other companies are also starting to produce, and scrap is believed to have been accumulating at the rate of about 1200 tons a month. Companies now producing, or soon to be in production, are: Superior Steel Co., Weirton Steel Co., Carnegie-Illinois Steel Co., American Steel & Wire Co., Sharon Steel Corp., Allegheny Ludlum Steel Corp., Acme Steel Co., Republic Steel Corp. and McClouth Steel Co.

The rapid piling up of this scrap with no developed program for its recovery is of serious concern to those responsible for the country's copper and steel production. A variety of recovery processes which showed promise have been tried but there is only one fully developed and practical process now available. This, the cupric ammonium carbonate process, is a standard leaching procedure as applied to copper ores.

The process is based on the solvent action of cupric ammonium carbonate on copper and zinc and has been shown to be workable on the clad material. It is a cheap and efficient method which will allow for almost complete recovery of the copper and the iron in separate products, the copper in the form of the oxide and the iron as unattacked scrap. The recovery of zinc remains the most unknown factor and may be poor unless an additional leaching treatment is performed on the copper precipitate before smelting.

Method is in Use

The process has already been demonstrated on a pilot-plant scale, and starting of commercial production will for the most part depend upon the availability of men and materials. Further experimental work or pilot plant testing is not deemed necessary. The process is not new, and all the metallurgical operations involved have been practiced successfully for years. Good recoveries and clean separations of the copper and iron are possible, and the operating costs are reasonably low.

Three known companies in this country have had experience with the leaching of gilded steel by the cupric ammonium carbonate method. These companies are the Calumet & Hecla Consolidated Copper Co. at Lake Linden, Mich.; the American Metals Co. at Carteret, N. J., and the Copperweld Steel Co. at Glassport, Pa.

Calumet & Hecla have operated for many years a cupric ammonium carbonate leaching plant in the treatment of copper ores. They also have, for the past couple of years, commercially treated copper-clad steel and have experimented on a laboratory scale with the processing of gilded steel scrap. At the present time, at their Lake Linden

BULLETS like those in this Flying Fortress' ammunition feed belts used to have caps of solid gilding metal. Now to save copper and zinc, nine companies are, or soon will be, producing gilding metal clad steel for bullet caps.

plant in Michigan, they have capacity to treat 2500 tons per month of gilded steel and are ready and willing to accept this amount of material immediately. They have an additional capacity of 7500 tons monthly for the leaching of bimetal scrap, but oxidizing equipment for the treatment of the additional material would have to be built. They have existing smelter capacity to handle the entire tonnage of copper oxide which should result from the processing of 20,000 tons of gilded steel per month. Although no recovery of zinc would be made under the present operating conditions at the plant, such an additional recovery plant could be installed.

The Copperweld Steel Co. has, for a number of years, experimented with the recovery of the copper and iron from the scrap made in the company's own plant. It now has a pilot unit under construction for the treatment of some of its own clad material.

The American Metals Co. operated an ammonia leaching plant for a number of years in recovering zinc from flue dust at Carteret.

The estimated recovery of the steel by the ammonium carbonate method is 100 per cent; of copper 96.5 per cent. The amount of zinc recovered would depend upon the subsequent treatment that is performed upon the mixed copper and zinc oxides which are the end products of the ammonia leach. A leaching scheme has been proposed by the Copperweld Steel Co. for the separation of the zinc oxide from the copper oxide, using a caustic soda treatment, but it is doubtful if this would be a practical procedure. The recovery of zinc will probably have to depend upon that obtained as flue dust in the smelting of the mixed oxides for the recovery of the copper. One company has estimated that 82.5 per cent of zinc can be recovered as impure zinc oxide in this way. In any case the amount of zinc involved is so small that it would not be at all practical to consider its subsequent treatment in other than existing zinc smelters or electrolytic plants. While it is unlikely that the zinc would be objectionable in the steel, it is thought that if it were not removed, the attack on refractories, particularly the checker work, would be serious. In addition, the zinc would be lost.

The three companies mentioned above are all considered qualified to construct and operate cupric ammonium carbonate leaching plants for the treatment of gilded-steel scrap. Aside from transportation, Calumet & Hecla are probably in the best position to carry on the work by constructing additions to their present plant. From the standpoint of transportation, it appears that the Cleveland or Pittsburgh area is the best location for a plant if the construction of a single central unit is contemplated.

The cost of constructing a plant to treat 10,000 tons of the scrap a month is estimated to be $1,500,000 to $2,000,000. Cost of operation is about $5.21 per ton of scrap. The over-all charge against the copper, as oxide, would be about 2.50c. per lb. There would be an additional charge of 2 to 3c. a lb. in the conversion of the oxide to electrolytic copper forms. Shipment of the oxide is a serious problem.

The steel resulting from the ammonium leach should be a clean product. If this material were compressed into a bundle, it could probably be classified as a No. 2 bundle taking a price equivalent to No. 1 heavy melting steel.

As far as preparation of the clad

Reclamation and Conservation of Metals

. . . This is No. 7 of a series of articles designed to aid industry obtain the utmost value from every pound of metal.

scrap before treatment is concerned, the American Metals Co. has suggested that the pieces be cut into approximately 6-in. squares, and crimped to prevent packing together of flat surfaces. Calumet & Hecla prefer the webbing in rolls, not only a convenient form for leaching, but also for charging into open hearths when the gilding metal has been removed. In no case should the material be baled.

Less Successful Methods

None of the other processes which were considered has been developed past an experimental stage, and none of them showed any worthwhile advantages over the ammonium carbonate leaching method.

However, electrolytic methods have been considered by three companies. The American Metals Co., Carteret, experimented with the recovery of the copper, using an ammoniacal electrolyte. Difficulty was encountered in the plating out of the copper. The metal went into solution readily enough, but only about 10 per cent of it could be deposited on the cathode surface. The trouble was attributed to surface oxidation, and it was thought that it might be overcome by maintaining a film of oil over the surface of the electrolyte. However, there seems to be no simple and efficient way of handling the scrap as anode material, and excessively large electrolytic tank areas would be required.

The Automatic Gasflux Co., at Cleveland, has had in mind the treatment of this scrap by electrolysis in a cyanide or sulfate bath. Rough production cost estimates of around 10c. per lb. of recovered copper were obtained, but insufficient work has been done to establish a definite cost figure.

The Copperweld Steel Co. has also worked with electrolytic recovery methods, with conclusions similar to those of the American Metals Co.

The American Metals Co. spent considerable time from May through July of this year trying to develop a suitable scaling procedure. The method consisted in heating the gilded scrap to a temperature somewhat below the melting point of the copper-zinc alloy and water-quenching from this temperature. A recovery of 50 to 60 per cent of the copper and zinc could be obtained as a mixture of metal and metal oxide scales. A second scaling treatment resulted in practically no additional recovery. Leaching tests were conducted on the scaled scrap.

Scaling was considered in the first place, because it was felt that ammonia or an ammonia salt might be difficult to secure. A saving of one-half of the daily consumption of ammonia is still indicated by the factual data, but because of the slowness with which the copper dissolves from the heat-treated scrap, the amount of ammonia required to start a plant remains approximately the same. The initial requirement is the big item as far as ammonia is concerned. The Copperweld people also studied scaling with similar conclusions that the method has no particular merit.

The Copperweld laboratories also worked with a sulfide scaling procedure. The bi-metal is dipped into molten sulfur, and the copper sulfide formed is ground or broken from the iron core. It was said that a copper sulfide layer 1/16 in. thick is formed in 4 min. The sulfide is brittle and easily scaled or broken from the iron. Information indicates that the resulting steel is so high in sulfur that it is almost worthless. The process is still in the experimental stage, and no cost figures are available.

In addition to the above-mentioned procedure, the Copperweld Co. has experimented with ammonium sulfate as a leaching agent. The copper is dissolved from the iron with the ammonium salt and is precipitated from the leach with sulfuric acid. Copper sulfate is recovered, and the reformed ammonium sulfate is returned to the leaching circuit. The sulfuric acid which is consumed in the precipitation stage could be recovered if the copper sulfate were subsequently treated by electrolysis. While this process is simple and undoubtedly workable in all its phases, it would require time to develop, and it offers no essential advantages over the ammonium carbonate method.

Editor's Note: Since receiving this report, the government has arranged for Calumet & Hecla to receive and treat 2500 tons of gilding metal clad steel scrap a month. The copper and steel are being reclaimed, but not the zinc. The company has not been authorized to increase its capacity, pending study by the government of other methods and sites mentioned in this report.

Dornier Armoring Examined

WITH an eye to keeping informed of the enemy's progress in self-protection for their flyers, the armoring of a German Dornier 217e-1 plane has been examined to determine its composition, gage and weight. These facts are not only interesting from the metallurgical standpoint but also as a key to the amount of dead weight being imposed on the carrying capacity of the newer types of German planes. The three pieces of armoring removed from the Dornier for examination were a pilot's seat back, a curved plate from the upper portion of the fuselage and a transverse bulkhead.

The pilot's seat back proved to be a welded component, 8½ mm. thick and weighing 126 lb. It's a chromium-silicon-molybdenum steel containing 0.49 C, 0.96 Si, 1.49 Cr and 0.23 Mo. A diamond pyramid hardness test shows a hardness number of 434.

The plate from the fuselage was 26 x 15 in. in size and 5½ mm. thick, and weighed 15 lb. An analysis showed it to be a steel of 0.30 C, 1.33 Si, 1.13 Ni and 1.08 Cr. The diamond hardness reading on this sample was 559.

A similar investigation of the bulkhead showed a thickness of 8½ mm. and a weight of 58 lb. Its dimensions were 44 x 20½ in. The chemical composition and hardness were similar to the fuselage plate.

The microstructures of each sample showed tempered martensite with the surface of the plates decarburized to a depth of 0.0020 to 0.0025 in. The surfaces of countersunk holes also were found to be decarburized, indicating that the holes had been drilled prior to final heat treating.

The composition of the three samples examined were different from those of other German armor plate previously examined but closely approached the composition of armoring taken from a Messerschmitt 109. In the Messerschmitt the composition was 0.46 C, 0.6 Si, 1.35 Cr and 0.55 Mo. Most noticeable feature of the silicon-chromium-molybdenum steels found in samples 1 and 3 (the pilot seat and bulkhead) was the somewhat higher than usual Si content.

Forging 37-mm. High

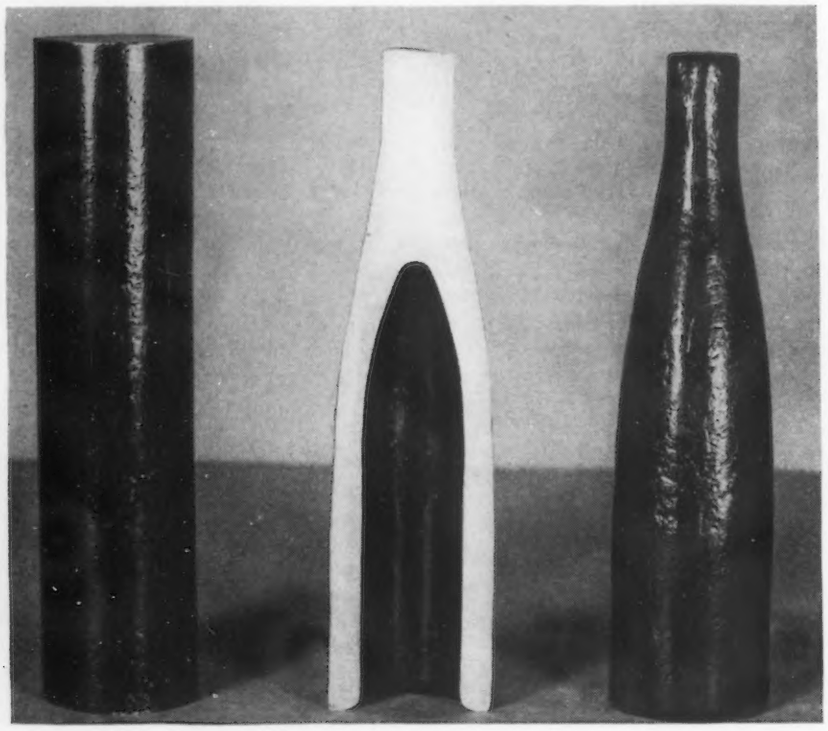

FIG. 1—(Left) Sawed proportion of bar now used to make a 37-mm high explosive shell—gross weight is 3 lb. (Right) inside and outside view of forging—gross weight 2 lb., a saving of 1 lb. of steel per shell besides several machining operations.

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THROUGHOUT the nation a great network of small manufacturers are helping to produce the needs of our Army and Navy. Among these small plants is the Portland Forge & Foundry Co., located in the heart of the Midwest in a typical small American town with a population of approximately 6000 people. Here with a few hundred employees are produced various types of forgings, all of which go to help make the sinews of war.

In the fall of 1940, one year before Pearl Harbor, this plant developed a new forging technique which was a worthwhile contribution to our national defense program. (THE IRON AGE, Oct. 16, 1941, p. 35.) It was one of the first to produce by upset method on a production basis, the 81-mm. trench mortar shell forging completely nosed, thereby cutting out the rough machining and nosing operation which was performed by the machiner. Since that time the company's engineers have assisted numerous other plants throughout the nation in solving their problems in shell production.

From coast to coast the War Production Board has been pleading with industry to conserve metal and save scrap. The Portland Forge & Foundry Co. has developed, after several months of experimenting, a 37-mm. high explosive hollow shell forging which should save millions of pounds of steel. Heretofore this shell has been made from bar stock with the machining waste equal to almost as much as the weight of the finished shell. First, the stock had to be drilled and reamed to form the inside cavity. Secondly, it took several minutes to rough the stock off the nose end before a finish cut could be taken over the entire contour. Besides the saving of steel, this newly developed forging will save the drilling of the inside cavity and the roughing of the nose end (Fig. 1) which in turn will greatly speed up production.

The process used in the making of this shell is not new to most manufacturers of forged shell projectiles. However, many of the practices used to produce the larger caliber shells had to be abandoned. The thought of making a forging with a thin wall section having a hole less than 1 in. in diameter and over 4 in. long did not appeal to the forging industry, but when a nation is at war and metal is more precious than money, the ingenuity of man usually brings forth developments which under normal conditions would not come into existence.

The forging was produced on an old 3-in. Ajax upset forging machine using the upset method (Fig. 2). Most of the work and experimenting was performed by the men after their regular working hours so that the production of other vital war materials would not be affected.

The shell forging is completed in five passes as shown in Fig. 3. The shell bars are sawed to lengths suitable for forging two shells which are upset from each end of the bar.

The first punch and die upset the stock and neck-in the middle of the bar. This preliminary upsetting and nicking of the stock is done in order to assure the proper centering and forming of an even collar which is necessary in the following operations for sound concentric forgings. The second punch pierces the billet and forms a collar on the upset end while the nippers further reduce the necked-in part. The third and fourth punches gradually expand and elongate the cavity in the forging as the nippers continue to reduce the necked-in part to a ¾-in. diameter. On the last or fifth pass the shell is cut from the bar by placing it in the stationary die, using the collar on the front end as a gage. A blade on the moving die (shown in Fig. 4) cuts the shell to an exact length as the dies close, then inserts into a recess in the stationary die to completely close the end of the die as the punch enters for the final piercing operation. The collar on the front of the forging then acts as a stripper when the punch is withdrawn. The

Explosive Shells

By CHARLES C. BARRENBRUGGE
Designing Engineer, Portland Forge & Foundry Co., Portland, Ind.

. . . A small firm who pioneered a mortar shell forging job has come through again on a difficult upset forging process in which the final punch is less than 1 in. in diameter and over 4 in. long. Other articles on shell forgings are reprinted in "Munitions and Ordnance Manufacture," price $1.

shell drops from the cavity and rolls out the side of the machine (Fig. 2).

A small punch press is placed by the side of the machine, making it convenient for the press operator to trim the collar off the shell. The shells are then given a 100 per cent inspection with various gages to determine the amount of eccentricity, ellipticity, etc. So simple is the setup that only four men are actually needed to produce the forging, namely: The forging machine operator, the heater, the press operator and the inspector.

The tool and die life is not the problem one would expect with the punches less than 1 in. in diameter and the final piercing tool over 4 in. long. The punches are designed so that only a small part of the nose of each actually does the piercing. Since only a minute part of each punch is in contact with the hot metal, it absorbs very little heat and this is dissipated by a regulated flow of coolant over the tools. Regulating the proper amount of lubricating solution over the dies and punches to control the temperature of each was one of the factors which made possible the forging of this small caliber shell.

The first four punches are made from a treated alloy die steel, and are not heat treated after machining. The fifth punch is made from shell die (made by A. Finkl & Sons Co., Chicago) and treated to a hardness of about 64 scleroscope. The dies are made of Hardtem A (Heppenstall), treated before machining and the cut off blade of Kloster DC-33.

The dies can be made by two different methods and both have their advantages. First, the impressions can be machined in a solid block (as shown in Fig. 4) copied from

FIG. 2—An old type 3 in. Ajax forging machine. Note the shells falling out the chute on the side of the machine after they are cut from the bar. In the background can be seen the oil fired furnace used to heat the steel billets.

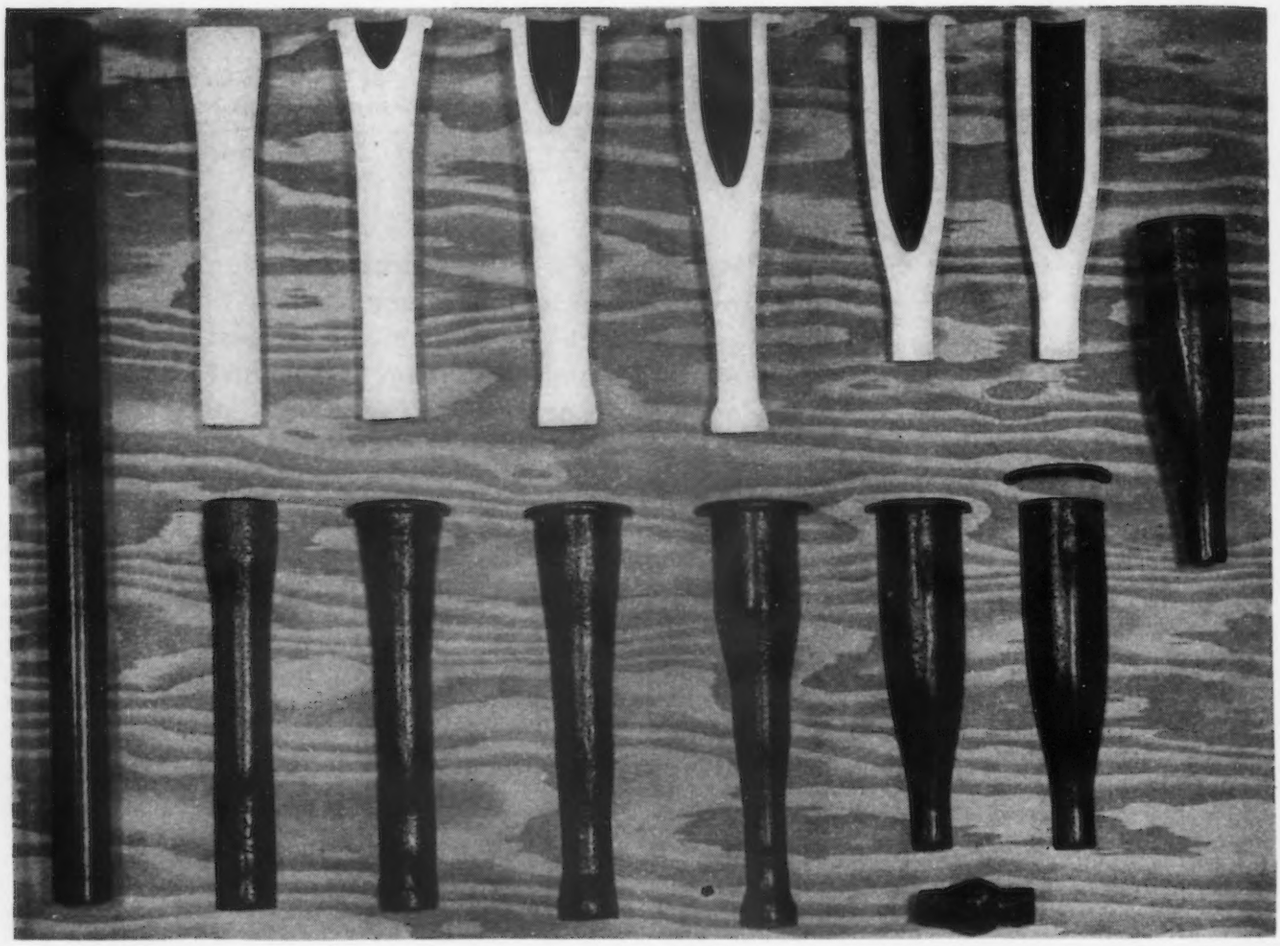


FIG. 3—Progressive steps in the forging of a 37-mm. shell in an upset forging machine. Two shells are forged from each bar. The only loss of material is the small piece shown in the lower right hand corner and the collar trimmed from each forging by means of a small punch press.

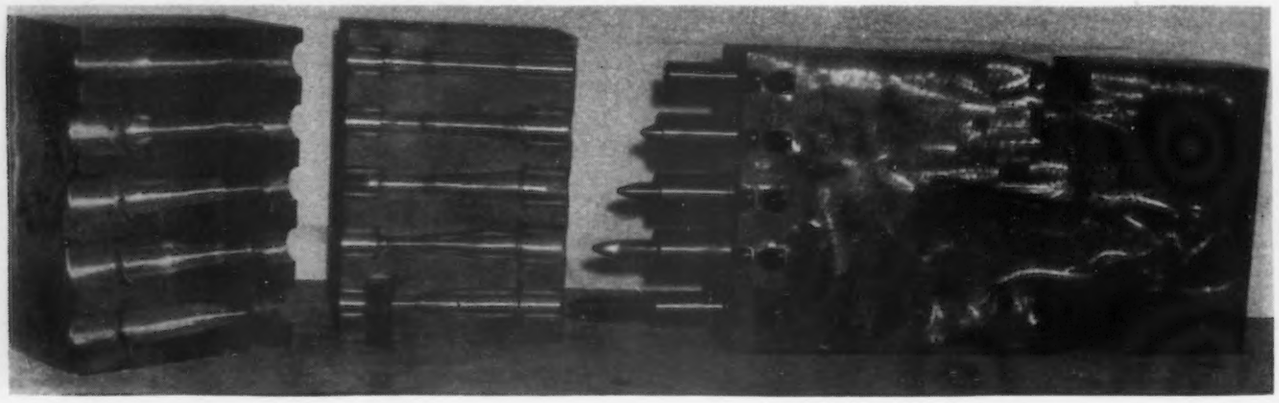
a master die on a Keller machine. This type of die is easy to resink by merely cutting 3/16 in. off the face of each block and resinking on the Keller. A great deal of die material per resinking can be saved by this method; however, should one impression wear more than another, it would be necessary to resink all the cavities. The other method uses a solid block with inserted cavities and nipper plates.

The nippers are made in one strip and inserted vertically in the die. Each cavity is fitted with a half round insert. These are bored two at a time on a lathe by means of a profile attachment. These inserts and nippers can be replaced an indefinite number of times.

An oil-fired furnace is used to heat the steel billets to a temperature of 2000 deg. F. Since the steel billets required are of a small diameter, they heat very rapidly. Therefore, one medium-size furnace will supply enough steel to keep the upsetter running at top speed.

This Midwestern plant is only one of the many thousand small industries throughout the country that are helping to eliminate many bottlenecks and shortages of materials, thereby bringing about an increased production of vital war implements.

FIG. 4—The dies and tool holder are made in one piece. The punches are so fitted that they can be changed in a very few minutes. On the lower pass of the moving die can be seen the blade which cuts the shell from the bar before the final piercing tool enters the cavity.



Stand-By Power for Gear Hobbing Operation

AUTOMATIC stand-by power equipment, manufactured by the General Electric Co., has proved successful in eliminating time losses due to power failure and in reducing costly spoilage in gear hobbing operations on marine speed reduction gears at the De Laval Steam Turbine Co. plant.

Certain of the final hobbing operations in the manufacture of speed-reduction gears cannot be interrupted or even subjected to appreciable speed variation without affecting the accuracy of the work. The reason for this is that differences in the momentum of the work with relation to that of the cutting tool will tend to produce variations in the depth of the cut.

To guard against power failure or excessive voltage fluctuation, it was decided to install a stand-by power source. The primary requirement was that the equipment have a capacity to supply the essential loads, ranging from 17 to 23 kw. (75 to 100 amp. at 230 volts), for not less than 4 hr. Experience showed that power failures would not extend beyond this length of time.

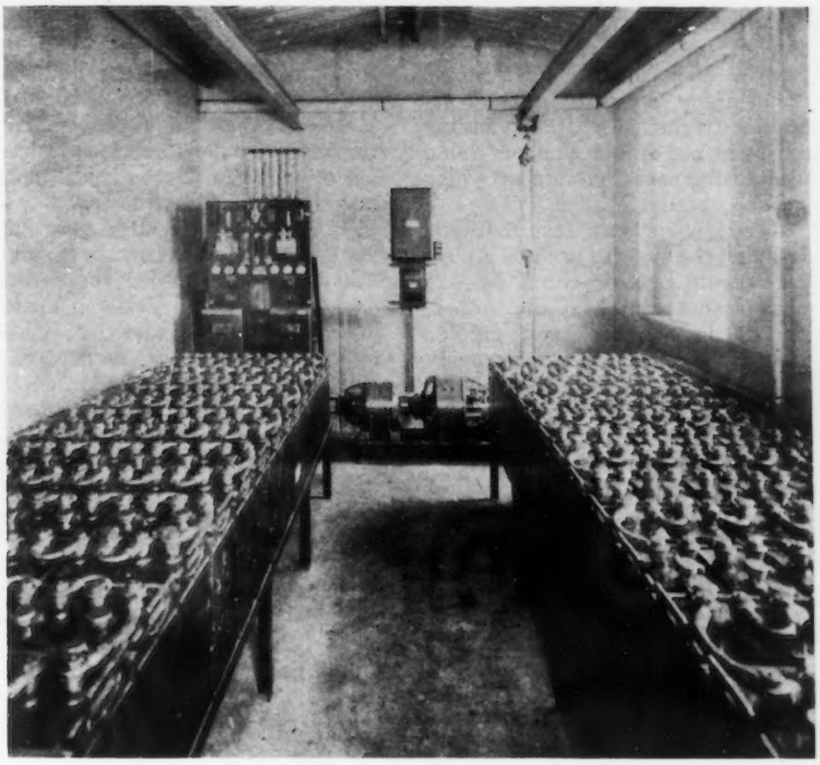
Other requirements were: Instantaneous and automatic transfer from stand-by to normal source and from normal to stand-by source; battery charge rates automatically varying from a trickle rate during stand-by periods up to more than normal rate if necessary, following emergency discharge periods.

General Electric engineers working with the Edison Storage Battery Co. designed an automatic power-supply system consisting of a motor-generator set, a battery and control equipment to meet these requirements. The motor-generator consists of one 15-hp., 230-volt motor and two 5-kw., 50-volt generators. The motor is supplied by the normal source during stand-by periods and by the battery during interruptions in normal source. The generators, each in series with half (96 cells) of the battery, regulate the voltage during both charge and discharge.

The control panel is provided with meters, an undervoltage relay, disconnect contactors, and voltage regulators with their control equipment. Two carbon-pile regulators vary the field current of the generators through voltage control across the battery during charge and across the load during discharge.

The regulators also perform the triple function of charging the battery at various rates from a trickle to more than normal; bucking the battery voltage during discharge when above the required load voltage and boosting the battery voltage during discharge when it is below the required load voltage.

All regulation is automatic, and is so close that machine operators in the gear hobbing department do not know whether power is coming from the normal source or from the battery.



A GENERAL view of the stand-by power equipment installed in the De Laval Steam Turbine Co. by General Electric, showing the storage batteries, motor-generator set and control panels.

SPARK SUPPRESSOR: Elimination of the fire hazard and soot nuisance from foundry cupolas are achieved by this device made by the Whiting Corp., Harvey, Ill. A double washing action removes nearly all solids, carrying them down a special drain pipe. Only 10 lb. water pressure is needed at the sprays. A cone prevents the water going down the stack.

Acid and Basic Bessemer

THE acid bessemer bottom or plug takes two main forms: A cylinder sometimes referred to as a "cheese" which can be inserted, or a dish which can be attached to the base of the converter. The general arrangement of a dish bottom is shown in Fig. 9. It will be seen that about 30 tuyeres are distributed symmetrically over the bottom, to obtain approximately even blowing conditions over the whole area, and that the space between the tuyeres is rammed with a refractory cement in which fillers, i. e. blocks of fired material, are inserted. The actual number of tuyeres varies somewhat with the plant, and of course with the size of converter, but with 25-ton converters it is usually between 25 and 35 per plug, while with 10-ton converters it may be 19 or less.

The tuyeres are made of fireclay, and generally contain about 10 to 20 per cent of grog. The latter may consist wholly of crushed fireclay brick or calcined fireclay, but sometimes contains an admixture of ganister. This does not react at all vigorously with the fireclay during the firing treatment, but does help to reduce cracking in the kilns. At first sight it would appear that such an addition to an aluminous fireclay represents a retrograde step, but sections cut through tuyeres after use show that most of the quartzite added is still there as quartz and hence presumably has at least as high a resistance to attack by ferruginous slags as the fireclay itself.

The tuyeres are circular in cross-section and for a 25-ton converter are between 33 and 36 in. in length. At the working end they are about 6 in. in diameter, and bell out to about 7¾ in. at the bottom. With 10-ton converters, the tuyeres' length is only about 2 ft. and since with both types the last 10 in. or so of the tuyeres cannot be used with any safety, the large converter possesses the advantage that a bigger proportion of the tuyeres is usefully employed. The number of the holes in the tuyeres is surprisingly standard, being from 7 to 10, while the hole diameters vary only from ½ to ⅝ in. The use of smaller holes would reduce the blowing efficiency due to frictional losses and would present a greater manufacturing problem due to the difficulty of obtaining rigidity in the piercing rods. The use of a larger hole would tend to increase the rate at which "boring" occurs.

It is a surprising fact that virtually all the tuyeres used by American plants are produced by one manufacturer and that the properties of the tuyere are very similar to those of the tuyeres normally used in Great Britain. The production of such a large shape in a material with as high a "mold to fired" shrinkage as fireclay, presents the manufacturer with a number of problems, but these have been successfully overcome and tuyeres of excellent quality are available at what would appear to be a remarkably low price. In Great Britain the method of manufacture is to dry mix the raw materials in a pan mill, pug the batch with water, extrude the rough shape of the tuyeres, place this in a suitably lubricated brass mold and then pierce the mass from what is eventually the bottom end of the tuyere, by means of a number of pointed steel rods. Suitable devices must be used to insure that the rods penetrate the mass in the direction desired, since otherwise the adjacent holes may be much closer together than was originally intended, and this may subsequently lead to "boring." The tuyeres are dried for several days on an ordinary steam heated floor, are trimmed, and then placed in a kiln where they are fired to a temperature of about 2550 deg. F. A comparison of the properties of British and American tuyeres is given in Table II. It will be seen that they are both of approximately 38 per cent alumina content and have a melting point of about 3000 deg. F. Their porosity is about 20 per cent and their bulk density over 2.00. Their permeability to air is fairly typical of a fireclay product of this density and refractoriness, while their resistance to thermal shock is excellent. Attempts

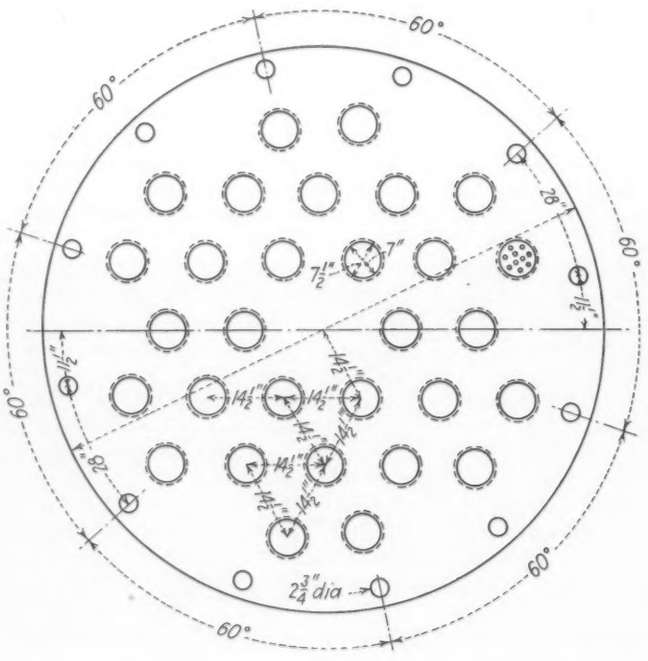


FIG. 9 — General arrangement of a "dish bottom" in a 25-ton acid converter, showing distribution of tuyeres.

Refractories

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. . . Concluding his study of bessemer refractories, the author presents data on materials, construction, costs and life of acid and basic bottoms. Last week, in the first of these two articles, the author discussed converter linings.

have been made to use other types of tuyeres; for example, unfired magnesite and chrome-magnesite both with and without a metal case, but the results obtained suggested that with present bottoms the use of such expensive tuyeres would not be economical. The most encouraging results so far have been obtained with tuyeres made from plumbago (clay-graphite). They showed a markedly higher resistance to slag attack, but here again the high initial cost is likely to prevent their general use.

The space between the tuyeres may be rammed entirely with some kind of refractory cement, but it is more usual to include a number of fillers, such as large prefired fireclay blocks. The economics of the use of fillers are still debatable. It would appear that their main function is as an insurance against premature failure of a plug due to lifting of the ramming material, that is, they act not merely as the coarse fraction of an aggregate, but as reinforcement of the ramming mass. Where blocks are used they are generally about 24 x 12 x 3 in, but more recently equally good results have been obtained by the use of roughly triangular fillers which can be extruded and do not require any special finish. The number of such fillers employed varies greatly from plant to plant. Thus in one type of 25-ton converter bottom, six slabs are employed; in another 27 slabs, or 62 triangular fillers, while in a third, of 10-ton capacity, only broken tuyeres are used for filling. The quality of the fillers is usually similar to that of the tuyeres, though in some plants old fireclay bricks such as can be obtained from open hearth furnace checkers are also employed.

It is theoretically possible to construct the entire acid bessemer bottom from a series of large fired blocks containing holes at suitable intervals as in the basic converter bottom. The cost of producing such blocks and of obtaining the necessary thin joints is so excessive that they have not been suggested except by way of experiment. Since the tuyeres are about 30 in. long with only the bottom 6 in. below the ramming level, it will be seen that the depth of ramming is considerable and that a large tonnage of material must be employed even where fillers are standard practice. The mass used to fill the gaps between the tuyeres and the blocks may be in a condition suitable for ramming or for pouring. At some plants the use of wet plugs is considered worth while, not because they last longer than plugs made by ramming a drier material, but because they are so much easier to make.

Where a wet slurry is used to fill the gaps, it generally consists of a ganister-clay mixture in which the ganister represents approximately two-thirds of the batch, the remainder being fireclay. Rammed dishes are more often made with a firebrick grog bonded with raw clay, the usual proportions being 60 per cent of grog to 40 per cent of clay. The raw clays used vary considerably, but for mixtures with fireclay grog they are generally aluminous, while with ganister they are frequently siliceous. Table III shows a typical* grading of the ramming mass used in a British plant.

It will be seen that the material is rather coarse, there being some 20 per cent in the ¼ to 7m. fraction. A sample of this ramming mass was shown to have the following analysis:

	Per Cent
SiO_2	59.6
Al_2O_3	36.6
Fe_2O_3	2.1
CaO	0.3
MgO	0.5
Alkalies	0.9

The grog and the raw clay used to make such a batch are ground

TABLE II

Properties of Acid Bessemer Tuyeres*

	BRITISH	AMERICAN
SiO_2	57.8	53.7
Al_2O_3	38.1	37.5
Fe_2O_3	0.9	3.1
TiO_2	0.7	2.2
CaO	0.4	0.5
MgO	0.4	1.5
Alkalies	1.0	not done
Pyrometric cone equivalent (Seger)	31 / 3074 deg. F.	31 / 3074 deg. F.
Porosity, g. p. c. c.	21.0	19.8
Bulk density, g. p. c. c.	2.02	2.14
Apparent specific gravity	2.56	2.67
Permeability to air (parallel to but excluding tuyere holes)	0.07	0.10
Thermal shock resistance	30+	30+

*For test methods see THE IRON AGE, Feb. 6 and 13, 1941.

together in a solid bottom pan mill and it has been found that, provided essentially the same procedure is employed, the grading of the product is remarkably constant. Particular care must be given to the water content which is usually kept at about 8 per cent. The ramming of the bessemer plug is generally done pneumatically, the material being fed in layers between the tuyeres, and filler blocks inserted at intervals. Doubtless some improvement in durability could be obtained by modification of the batch but as long as the tuyeres are the weak spot in the plug, there would not appear to be much point in such changes. If, however, plumbago or basic tuyeres were used at all generally, the development of an improved ramming mass, possibly itself of a basic or neutral character, would be worth while even for the acid process. Where the plug is made in the form of a "cheese," the same arrangement of tuyeres, fillers and ramming mass is obtained, the whole being assembled inside a cylindrical steel shell which can be removed prior to the "cheese" being inserted in the drying oven. The ideal drying oven for this operation would appear to be a tunnel kiln but even an elementary study of the problem shows that the rate of drying must be so great if the necessary plugs are to be available with only a limited number of dishes, that the drying arrangements must be a compromise between the ideal and those which will insure rapid drying at least of the top section of the plug. This is generally achieved, not by slowly heating up the plug at a predetermined rate, but by inserting the wet plug in a drying oven maintained continuously at a temperature somewhere between 400 and 900 deg. F. Under these conditions, the surface water evaporates rapidly but there is still considerable water in the lower sections of the plug even after four days in the stove, as can be readily shown by inserting a cold steel rod into a tuyere or vent hole. To dry such a mass of fireclay material with the care given even to smaller masses in a firebrick works would take weeks, if not months. That such plugs can be sufficiently dried in so short a time without undue cracking is doubtless due in the main to the large proportion of coarse prefired material in the batch.

Drying can be speeded up somewhat by venting of the steel dish. Where wet plugs are dried under similar conditions considerable cracking does occur and fissures up to ½ in. in width appear in the ramming mass. Even so, the trouble in the converter due to flaking away of the surface is not considered sufficient to justify a more ideal drying practice.

TABLE III

B. S. I. Sieves	Approximate Tyler Sieve Equivalents	
½ to ¼ in.	½ to ¼ in.	10 per cent
¼ in. to 7m.	¼ in. to 8m.	10 per cent
7 to 25m	8 to 28m.	30 per cent
25 to 72m.	28 to 65m.	20 per cent
72 to 150m.	65 to 150m.	10 per cent
Through 150m.	through 150m.	20 per cent

After drying, the dish is taken to the converter, but prior to bolting it in position, a layer of cement is placed around the circumference of the dish to insure a tight joint with the vessel lining. For this purpose a ganister-clay mixture is usually employed.

Bottom Life and Costs

The life of a bessemer bottom varies from about 10 to 40 blows according to the working conditions. Using a blowing pressure of about 24 lb. per sq. in., a blowing area of about 60 sq. in., a bath depth of about 20 in. and a blowing volume of about 30,000 cu. ft. per min. it is possible to blow a 25-ton converter in just over 10 min. Given these conditions and a favorable manganese to silicon ratio, the average plug life may be as high as 34 blows. At one plant, a record life of over 40 blows has been obtained. The corresponding bottom costs including labor and the cost of drying, are then as low as 10c. per ton of steel, making, with the lining cost, a total of about 20c. per ton of steel, which is only a small fraction of open hearth furnace costs. With 10-ton converters, a life of 20 to 25 blows is quite usual and a smaller blowing volume can of course be used. If, however, there is any serious drop in the blowing volume then a corresponding drop in plug life may be expected. This, together with a less favorable manganese to silicon ratio may result in an average plug life of only 16 blows, about half that obtained under the best conditions. Such short lives are almost always associated with a long blowing time, say 22 to 24 min., and the corresponding plug cost is frequently 25c. or more. The appearance of a plug, after use, is illustrated in Fig. 10. It will be seen that the tuyeres have worn back preferentially, leaving the ramming mass and fillers standing proud of the remainder. Periodically one tuyere goes back at a rate out of all proportion to that shown by the remainder. The cause of this trouble, usually referred to as "boring," is not clear, but it appears probable that it arises from some local inequality, for example two tuyere holes being abnormally close together, resulting in the production of a cavity in the tuyere end (Fig. 11). Once this cavity has been formed, a quantity of metal will tend to fall into it due to localized reduction in effective blast pressure, and this metal will be set in rapid motion by the air blast in much the same way as a ping-pong ball spins on a jet of water. Moreover, the intense oxidation will result in this metal being highly corrosive and in addition superheated.

The rate at which boring takes place is nothing less than phenomenal, being about 1 in. per min. It has been suggested that boring

TABLE IV

Comparison of the Properties of the Longest and Shortest Tuyeres in a Used Acid Bessemer Plug

	Longest Tuyere	Shortest Tuyere
Porosity, per cent	18.0	18.1
Bulk density, g. p. c. c.	2.08	2.06
Apparent specific gravity	2.53	2.52
Permeability to air (parallel to but excluding tuyere holes)	0.093	0.056
After-shrinkage 1 hr. at 2550 deg. F.	no change	0.6 per cent (Sh.)
Refractoriness under load, 50 lb. per sq. in..		
Rising temperature:		
Initial softening	2460 deg. F.	2085 deg. F.
Rapid softening	2625 deg. F.	2550 deg. F.
Fail (10 per cent deformation)	2985 deg. F.	2875 deg. F.
Thermal shock resistance	30+	30+
Melting of slag on tuyere end	2515 deg. F.	2480 deg. F.

FIG. 10 — Bottom of 25-ton acid bessemer converter after use. Note depth of tuyere ends below the ramming.

may be due to the presence of an inferior tuyere and consequently rapid wear which then becomes a self-accelerating process. To check this theory, a comparison has been made of the longest and shortest tuyeres in a considerable number of worn out bottoms. One such comparison is given in Table IV. It will be seen that there is no significant difference between the properties of the long and short tuyeres. Fortunately the boring of one or more tuyeres does not put the plug out of action since the offending tuyere may be "dummied-up" by ramming fireclay into it, or may even be removed entirely and a new tuyere inserted.

The analysis of slag removed from a tuyere-end after use shows that the main attack is due to iron oxide and manganese. The durability of the tuyere must therefore be considered in the light of the quaternary diagram FeO-MnO-Al_2O_3-SiO_2 which unfortunately has not been worked out in any detail. Such work as has, however, been done shows that the addition of only 20 to 30 per cent of a mixture of FeO and MnO to an aluminous fireclay, decreases the melting point to about 2000 deg.F., and is therefore likely to result in very fluid slags at bessemer temperatures. The swirling of metal and freshly formed slag against the tuyere-end must also be a cause of wear and will tend to be a maximum in these positions rather than above the ramming mass. It is not, therefore, surprising that the tuyeres tend to wear more rapidly although other things being equal they would probably be more durable than the material from which the ramming mass is made.

Sections cut through acid bessemer slag suggest that a considerable amount of wear on the ramming is due to "stoning," the loss of complete and largely undissolved particles of grog due to the attack on the surrounding bond, a phenomenon well known to glass technologists. A great deal still remains to be done on the mechanism of bessemer bottom wear and the technique of suppressing it. Thus, there is still no very clear picture of the distribution of the metal over the surface of the refractory during the blowing period or of the way in which this is influenced by variations in the blast pressure. One thing is, however, certain, that too high a blast pressure results in excessive losses due to spitting, while too low a blast pressure causes increased wear on the refractories and, in extreme cases, the penetration of metal into the tuyere holes. No definite information is available regarding the effect of periodic, as compared with continuous, use of converters, but by comparison with other furnaces it is highly probable that allowing a converter to cool to atmospheric temperature between blows is destructive of the refractories both in the plug and in the vessel lining.

The slag formed originates mainly, of course, from oxidation of silicon, iron and manganese in the iron but the fact that it contains approximately 4 per cent of alumina shows that it is a reaction product of these oxides with the refractories in the plug. Indeed, the amount of alumina present in the slag is a fair indication of the amount of wear which has occurred during a blow. One minor point that must have an effect on tuyere life is the amount and nature of the scrap used and the way in which it is introduced into the converter. In some plants it slides down a chute and dives into the converter, hitting the bottom at a speed that can only be slightly decreased by the buoyancy of the metal. The energy of the blow can at least be reduced, as is done in some plants, by the use of a trap door at the end of the scrap chute which removes part of this momentum before the scrap enters the converter.

Basic Bottoms

The basic bessemer bottom is essentially a refractory "cheese" (Fig. 12) which fits into the bottom of the vessel and has passing

through it a number of holes through which air can be blown. For a 25-ton converter, such a bottom is about 7 ft. across and approximately 3 ft. deep. With larger converters such as the 40-ton vessels employed in certain German plants, larger bottoms are of course required.

The refractories for the basic bessemer process, unlike those for the acid bessemer, are mostly prepared in the bessemer plant. The raw materials are dolomite, (usually calcined for this purpose at a lower temperature than for open hearth furnace work), and water-free steelworks tar. The proportion of tar in the batch varies considerably with the general technique employed (the fineness of grinding and the method of ramming), but is usually between 7 and 12 per cent. The firing practice in terms of rate of heating is also a controlling factor in deciding the permissible tar content. In addition to insuring that the tar is water free, a limit is usually placed upon the other constituents of the tar, in particular the amount of naphthalene. When this limit (about 3 per cent) is exceeded, it has been found that the possible storage time is decreased, and the life of the bottom in service falls off. The grading and mixing of the material is of the utmost importance. This is usually carried out in at least two stages: Lump basic (calcined dolomite) is passed through a gyratory cone crusher or other suitable granulator and is then mixed in a solid bottom pan mill with a controlled addition of tar. The best practice provides for the heating of the pan mill by steam coils, and insures that the tar is maintained at a temperature of approximately 160 to 180 deg. F. before being mixed with the pre-crushed "basic." By this means, it is possible to obtain a complete coating of tar round the grains of dolomite during the final grinding and mixing in the pan mill. The amount of grinding occurring in the pan mill is not great but is sufficient to increase considerably the packing density of the final product.

A basic bessemer bottom can be built using magnesite tuyeres and ramming the interstices with tarred dolomite, but more often the plug is a monolithic structure, the holes being evenly spaced over the area instead of being placed together in groups of 7 to 10 as with the acid bessemer. In a 25-ton converter the tuyeres are approximately 13 mm.

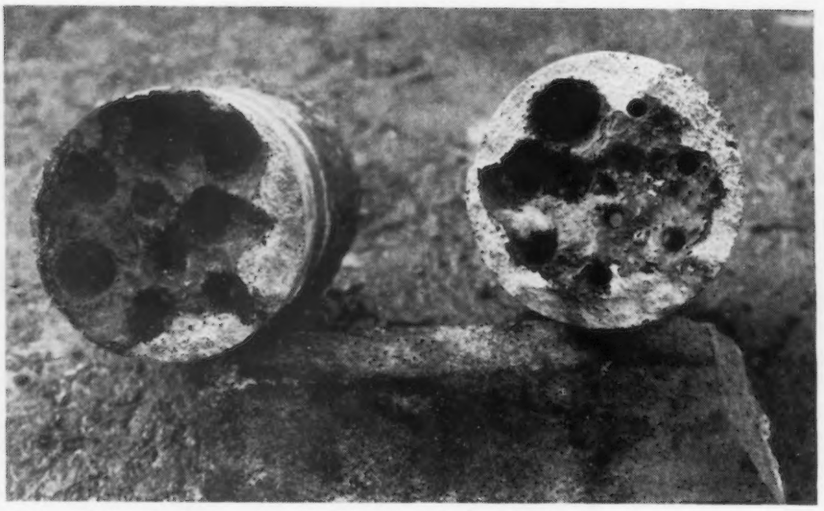

FIG. 11—Used acid bessemer tuyeres showing uneven wear and results of "boring."

in diameter, about 270 in number and are spaced evenly in the form of a square.

Welter claims that a 5 per cent improvement in bottom life can be obtained by using preformed tuyeres of tarred dolomite. With such bottoms 40 to 50 tuyeres are employed, 7.1 in. in diameter and 29.5 to 37.4 in. high. These dolomite tuyeres contain only four holes and are placed in position in the bottom plate without prefiring. They can be pressed at the rate of 4 min. per tuyere and 2 to 3 hr. are therefore required to make a complete set for one bottom. The tarred dolomite used to fill the gaps between the tuyeres may have a low tar content, in which case it is rammed pneumatically, or a high tar content, in which case it is simply poured into position. The latter process takes about 5 hr. as compared with 6 hr. for pneumatic ramming. The bulk density of tuyeres made in this way is much the same as that of blocks pressed for bessemer side walls and it is claimed that the rate of erosion at the tuyere hole is less than in a monolithic bottom and in particular that there are less funnel-shaped holes formed. Thus in two sets of trials, bottoms made from tuyeres averaged 52.0 blows and 70.5 blows as compared with 48.5 and 67.5 respectively for normal bottoms. The record for a normal bottom at this plant was 88 blows and that for a tuyere bottom 96 blows. The normal bottoms used at this works contain 12 to 13 per cent tar as compared with 9 per cent for the tuyeres and 16 to 18 per cent for the material poured between the tuyeres. Where preformed tuyeres are employed, they represent about 55 per cent of the total bottom weight, which is considerably greater than the corresponding proportion for the acid bessemer process.

The technique used in ramming a bottom is very complicated compared with that used in the acid process. Special machines have been designed, which undergo complex motions in order that the bottom shall be stamped in a specific manner, each area of the bottom being given equal treatment. As the bottom is rammed, needles are automatically thrust up through it from below so that when the ramming is complete, the needles can readily be brought through to the surface to give the necessary tuyere holes. The portion rammed at one time is usually governed by the capacity of the pan mill serving the bottom stamping machine. Care must always be taken to roughen the rammed surface of the previously stamped portion to insure agglomeration and freedom from lamination. After the needles are withdrawn, wooden dowels are driven into the tuyere holes to prevent them from being stopped up by collapsing during the firing period.

The bottom, in its metal casing, is covered with a heavy circular casting to prevent swelling of the monolith, and the whole is placed in the drying oven. Here again the term "drying" is a misnomer, the final temperature being between 930 and 1380 deg. F. Some type of tunnel kiln is generally used, the bottoms entering the kiln on bogies which take about a week to pass

through the kiln. The rate of progress through the oven is governed by the amount of tar used in making the bottom, the optimum rate of heating is one which enables the tar to be converted into a form of coke, without loss of tar by burning from excessive or quick firing, or by draining into the lower portion as a result of slow firing. Such firing of tarred dolomite in a reducing atmosphere has a peculiar effect in increasing the durability of the bottoms in storage. Thus although ordinary tarred basic hydrates seriously in a matter of days, such calcined bottoms, if left in their metal case can be allowed to stand for months without any obvious deterioration.

Various ideas have been suggested to increase the durability of bottoms; among them, the insertion of metal tubes in the tuyere holes and the use of both vertical and horizontal reinforcements. Welter also refers to the use of inclined tuyere holes to decrease spitting, but does not claim that this procedure results in any increase in plug life.

Typical data given by Broel for 40- to 45-ton converters are as follows:

Dia. of bottom	10 ft.
Thickness	3 ft. 3 in.
No. of holes	348
Hole dia.	0.57 to 0.59 in.
Total blowing area	2.7 sq. in. per ton of metal charged

With a dolomite bottom and dolomite vessel lining it might be expected that the gap would also be filled with dolomite. In most plants this is the method employed, the dolomite being ground with an excess amount of tar, to give a slurry that is subsequently dried out by means of a coke fire.

Bottom Life

A typical life for a 25-ton basic bessemer converter is 40 to 50 blows. With the 40 to 45-ton converters described by Broel, a life of 64 charges for the bottom and 380 for the side walls, is claimed. These results were obtained with an initial metal temperature of about 2155 deg. F., a pouring temperature of 2640 to 2680 deg. F. and a maximum blowing pressure of 33.8 lb. per sq. in. The blowing time for a 35-ton charge was about 18 min. and the total time from charge to charge was about 30 min. The dolomite consumption with these converters was 22 to 26 lb. per ton of steel, which again represents a low refractories cost compared with the open hearth furnace. Every fourth or fifth bottom is inserted together with a new vessel lining. When this first bottom wears down to about 1 in. in the center, the bottom plate is taken off and after a few holes have been drilled near the joint, the old bottom is pushed in. The joint is then cleaned up and a new bottom placed in position, the space between the bottom and the vessel being filled with a tar dolomite slurry. The tuyere holes are previously plugged at the top with soft clay to prevent any slurry from entering them and are cleaned prior to putting the converter back into use. In general four such replacement bottoms are used before the vessel lining is sufficiently worn to require complete replacement. The slag formed is altogether different from that obtained in the acid process, a typical range given by Broel being as follows:

	Per Cent
Total iron	8-11
Manganese	4.5
Lime	48-52
Magnesia	1.5-2.5
Phosphorus pentoxide	19
Residue	7-9

The lime comes, of course, from the lime charged—no such addition being made in the acid process, while the magnesia comes from wear on the converter bottom and side walls and may be used as an index of the amount of corrosion occurring during any particular blow. According to Heyden there is little relation between the blowing time and the amount of dolomite consumed, but in view of the marked correlation in the acid process, further study of this relationship might well be worth while.

Acknowledgment

In conclusion, the author should like to express his thanks to Dr. T. Swinden, director of research, and W. L. James of United Steel Companies Ltd., for permission to publish this article; and to Wm. C. Bell of Stewarts & Lloyds Ltd., and F. Cawley of United Steel Companies Ltd., for their collaboration in its production.

FIG. 12—Basic bessemer bottom after firing. Note the distribution of the tuyere holes on the square lattice.

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Low Temperature Metal for Proof-Casts and Protective Coating

THE need for a low temperature melting metal for use in accurately proof-casting cavities such as molds, gun chambers, forging dies, etc., is being met by a new alloy known as Cerrosafe, developed by the Cerro De Pasco Copper Corp., New York. The company also reports the metal's success when used as a filler behind delicate parts to be machined or ground in profiling or duplicating machines and also as a protective coating for wood core molds and patterns.

Many materials have been used for proof-casting but were found objectionable because they were either fragile or had excessive shrinkage, or the casting temperature was sufficiently high to cause inaccuracies due to thermal expansion and distortion of parts surrounding the cavity. Cerrosafe has none of these disadvantages.

The new metal is described as an alloy of bismuth, lead, tin and cadmium, that becomes completely molten at 190 deg. F. It can be poured at this temperature and may be removed from the cavity before or when it reaches room temperature. Cerrosafe shrinks for a few minutes after it solidifies then gradually replaces this shrinkage with growth which takes place during the first 2 hr. after reaching room temperature. Because of this property, the alloy casting expands to within a fraction of 0.001 in. per inch of a given dimension of the cavity.

Data on the thermal shrinkage and growth of Cerrosafe are shown in the following table:

	Per Inch Approx.
During solidification and cooling to room temperature, shrinkage	0.0050
30 min. after reaching room temperature, growth	0.0000
1 hr. after reaching room temperature, growth	0.0022
2 hr. after reaching room temperature, growth	0.0042
4 hr. after reaching room temperature, growth	0.0043
12 hr. after reaching room temperature, growth	0.0045
24 hr. after reaching room temperature, growth	0.0047
48 hr. after reaching room temperature, growth	0.0048
200 hr. after reaching room temperature, growth	0.0049
500 hr. after reaching roonf temperature, growth	0.0050

The major advantages, as can be seen from this table, are that the finished casts represent a high degree of accuracy due to the growth factor which offsets the natural thermal contraction plus the fact that low temperature obviates the distortion of delicate parts which might be seriously affected by higher temperatures.

Another important use of the alloy is as a filler behind delicate parts to be finished or duplicated. In this application, the part is located by means of micro-jacks on the bed plate of the machine. A dam of babbiting clay serves as a mold and the alloy is cast behind the part. Acting as a filler, the alloy prevents spring and distortion of the part during machining. The metal is also recommended for making accurate models for engraving machines in cases where the guide stylus pressure is low.

Most recent development for the alloy is its use as a protective coating for wood core molds and patterns. For this use the alloy is melted and applied by means of low temperature spray guns, such as the one illustrated. The Cerrosafe alloy can thus be sprayed in any desired thickness on wood patterns after they have received a coating of shellac. The metal coating thus applied is said to increase the life to almost that of a solid metal pattern and minimizes the changes of moisture content which are the principal cause of warpage.

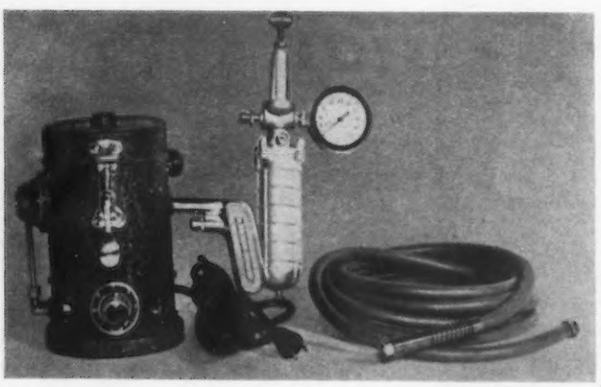


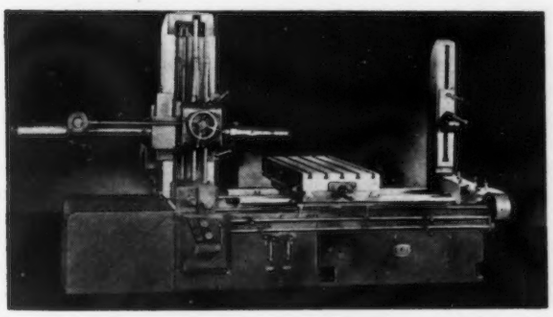
FIG. 1 — Typical of the low temperature spray guns used to spray the new low melting alloy, Cerrosafe, is this self-contained, portable "metal atomizer," manufactured by the Alloy-Sprayer Co., Detroit. This gun is said to handle any neutral alloy at temperatures up to 600 deg. F. and will accomplish melting within approximately 12 min. by means of an electrically heated pot. A thermostat maintains any preset temperature and a variable range of temperatures are available by means of a rheostat which which permits adjustment within 100 deg. to accomodate various alloys.

New Equipment . . .

Machine Tools

Some of the many design improvements and construction advances in turret lathes, shell lathes, boring mills and other vital equipment made by machine tool builders are discussed herein.

THE YODER CO., 58th Street and Walworth Avenue, Cleveland, announces a horizontal boring mill with "power touch control" in which the turn of the hand control replaces gear shifting levers. Use of a Reliance V-S drive (motor-generator and d. c. motor) gives an infinite number of speeds and feeds, which may be obtained without gear shifting. This speed change unit embodies high acceleration and quick dynamic stops without shock or strain to machine parts. All controls are centrally grouped. Starting, stopping and reversing of machine and feed is controlled through two bars running along the front of the machine. There is a 16 to 1 speed variation on spindle and feed. Extremely slow speeds of cutters, tools and parts can be obtained for set-up work. A two-speed rapid traverse facilitates inching up to the work at a slow rate and at a high rate



when considerable travel must be made. The main drive for the spindle is direct from a d. c. motor through a worm gear, while the feed drive is from another motor through positive clutch drive.

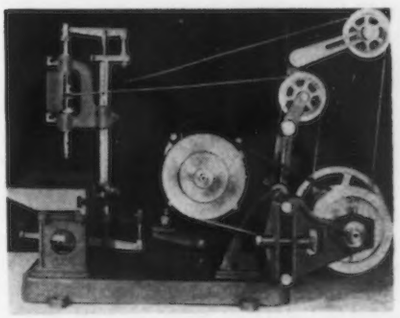
Small Gear Finishing Machine

TO make possible the rapid finishing to high accuracies gears of less than 4 in. diameter and less than 1 in. face width by the crossed-axis principle of gear shaving, a

new finishing machine, the 861-4B, is announced by *Michigan Tool Co.*, Detroit. The new 861-4B is automatic in operation, with combination cam and electric control simplifying and speeding production of gears. The machines are so designed that a number of them can be installed in a single battery, with one operator taking care of several machines. In operation, the gear is placed between dead centers. A serrated-tooth rotary cutter, mounted on an axis at an angle to that of the gear, engages and drives the gear, first in one direction and then in the opposite direction, to finish both tooth faces. During the cutting operation and infeed the cutter also reciprocates back and forth across the face of the gear, permitting the use of narrow cutters. Both the cutter cross-feed and the infeed to the correct center distance are cam controlled. The illustration shows a gear mounted on a quick-assembly mandrel. The machine permits finishing a wide variety and sizes of gears with a single cutter for each pitch and pressure angle. Once the machine is adjusted for a given size and the proper cutter selected for the pitch of the gear, operation becomes entirely automatic. Limit switches and dogs are provided for reversing the machine during its operating cycle. The machine is equally adaptable to finishing gears of stainless steel, carbon steels and non-ferrous materials including brass, bronze, fiber, etc.

Super-Sensitive Drill Press

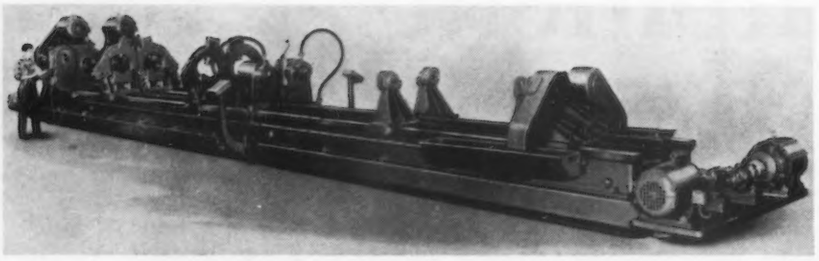
THE EDWARD BLAKE CO., 634 Commonwealth Avenue, Newton Center, Mass., announces a new super-sensitive drill press for extremely small drills and other



tools. The machine has a standard range of eight speeds from 3000 to 23,000 r.p.m., for drills from 0.004 to 1/16 in. in diameter. Sensitivity is attained by balancing the spindle by means of the vertical component of the belt tension. This sensitivity, plus convenient finger-tip control, is said to reduce drill breakage to a minimum. Machines with one, two, three and four spindles may be furnished. Standard equipment includes two spindles for each spindle mount—one for Jacobs chuck, and one with tapered hole for tapered shanks. Each spindle is furnished with an independent finger-tip control and each spindle may be run at an independent speed.

Drilling and Boring Machine

A TWO-SPINDLE deep hole drilling and boring machine, designed to drill or bore two parts simultaneously in completely independent cycles has been announced by *W. F. & John Barnes Co.*, Rockford, Ill. With this new machine, each work piece is driven by independent headstocks and is supported

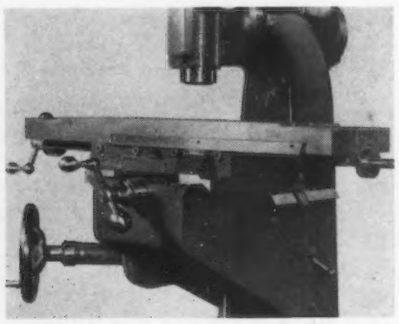


by separate steadyrests. The tools are fed by independent hydraulically actuated slides. Four-jaw independent type chucks of 15 in. diameter are normally furnished with the unit, but chucks up to 24 in. diameter may be used. Stroke is 16 ft. and the swing is 25 in. diameter. The spindles are on 26 in. centers. Maximum length of part is 15 ft. 8 in., and tool size is 5 in. A V locator is incorporated into the three-point roller bearing steadyrests and provides support for the workpiece when loading and unloading. The whip supports are positioned midway between the tool holder and the tailstock at the beginning of the work cycle. They remain stationary until the tool slides have been fed forward to meet the whip supports. The whip supports are then carried along the ways until the feed cycle is completed.

The machine may be completely controlled from each of four push-button stations, two on either side of the machine at the side of the head and at the center of the machine. Each spindle has its own motor-driven high pressure coolant pumps. Two motor-driven hydraulic feed and traverse units mounted at the head end of the machine actuate the hydraulic feed cylinders mounted in the base.

Small Vertical Miller

BLANK & BURTON MACHINERY CO., Jackson, Mich., announce a change in the vernier mountings on its Index vertical miller. In the past they were mounted straight up and down requiring the operator to stoop to read them. Now they are mounted on an angle as shown. Another recent added feature is power feed to the spindle. This is an extra made available in answer to requests from users who have been using the machine for precision boring on jigs and fixtures and intricate small parts. An area 8 x 16 in. can be milled, drilled and bored at one setting. The spindle runs in super precision preloaded ball bearings. Capacity is for end mills up to ⅝ in. in tool steel. Quill movement to spindle is 3¼ in. Head swivels 90 deg. either way. Working surface of the table is 8 x 22 in., overall length 30 in., six standard spindle speeds range from 180 to 2400 r.p.m.



Gear Shaving Machine

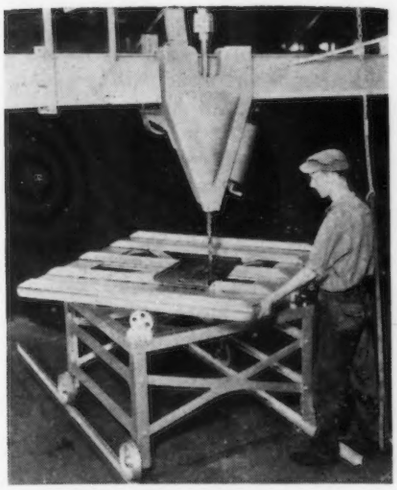
NATIONAL BROACH & MACHINE CO., Detroit, has developed a small gear shaving machine especially for instrument gears from ¼ to 4 in. pitch diameter—a machine which will finish these gears in from 8 to 48 sec. per gear. It is known as the Red Ring Model GCL-3 gear shaving machine and handles gears with diametral pitches of from 20 to 48 and finer. Essentially a bench type machine, it is usually furnished with a base which contains coolant system and an electrical control panel. The unit is a vertical type. Like other Red Ring gear shaving machines, the GCL-3 incorporates the principle of rotary crossed axes shaving, using a gashed helical cutter which drives the work gear as it is being cut. The cutter of this machine rotates only in one direction. In addition to the cutter spindle drive, there are two slides both operated automatically. The vertical slide carries the cutter head and the horizontal slide carries the work centers and reciprocates the work parallel with its axis across the face of the cutter. The operation of the two slides is so synchronized that in one cycle of the cutter head slide, the work slide will make 4, 6 or 8 strokes as desired, depending upon the amount of metal to be removed. The cutter head slide is actuated by a cam through a counterbalanced lever arm, and the finished gear size is controlled by this cam. Table reciprocation is likewise attained by a cam and lever operation. Three speeds of table reciprocation are available. This, in addition to the three cutter spindle speeds and cycles of 4, 6 and 8 table strokes, provides practically an unlimited range of operation control.

Motorized Drive for Automatics

DRIVE-ALL MFG. CO., Detroit, has perfected an individual motorizing installation for older belt-driven Cleveland automatics. Only one electric motor drives all the units on the machine instead of two or three formerly needed. The gear box and motor are attached to the machine, using standard brackets and this same supporting standard mounts the jackshaft that drives both the pump and the feed. A 1½-in. square bar running the full length of the machine provides a backbone for the installation and a base on which to mount the various brackets. Motor-driving Cleveland automatics furnish a more positive transfer of power to the spindle and allow for speed changes to compensate for differences in diameters and of materials.

Drill and Drill Table

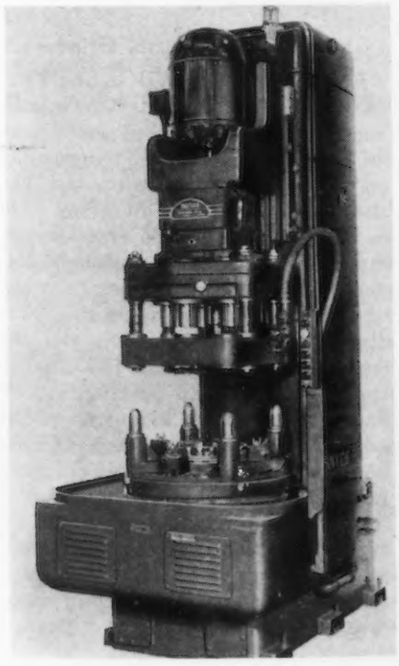
THE Kelly - Springfield I-beam production drill and drill table. manufactured by the *O. S. Kelly Co.*, Springfield, Ohio, were developed primarily to drill heavy armor plate, but their range is so flexible that they lend themselves to many boring, tapping, drilling and ream-



ing operations, with four speeds forward and reverse. With the 6:1 ratio heel pressure feed, the life of high speed tools is said to be lengthened from four to five times before regrinding is necessary. For bringing the work to the drill, the table-top turns freely 360 deg. and a positive brake is available to the operator. For further adjustment, the entire table travels on a 9 ft. track. The drill unit mounts on a standard 10 in. light structural I-beam.

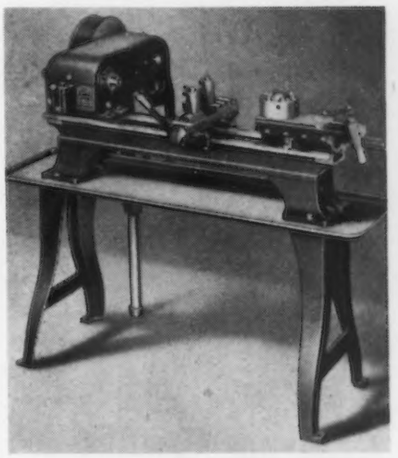
Drilling Machine

THE 10 V 18 general utility drilling machine illustrated, manufactured by *Snyder Tool & Engineering Co.*, Detroit, is equipped for hollow milling 20 bosses, using a 5-spindle head. The fixture indexes four times to complete the work. It has a capacity up to 15 hp., 1800 r.p.m. for driving tools. Maximum stroke is 18 in. and the opening between the base and the speed change transmission is 36 in. minimum, 56 in. maximum. The maximum total hydraulic pressure feeding the hydraulic slide downward is 12,000 lb. The hydraulic oil is contained in a reservoir mounted on top of the column and on the inside of the column are housed the hydraulic pump, its motor and the counterweight to balance the hand slide and multiple head. The standard index mechanism provides smooth acceleration and deceleration of the Geneva wheel and the index table serves as a chip trough and coolant retainer. This machine is available with or without special tooling and speed change transmission for single or multiple spindle adaptations.



Hand Type Turret Lathe

A NEW hand type turret lathe has recently been annuonced by the *South Bend Lathe Works*, South Bend, Ind. It is designed for small chucking or bar work. This lathe has a 10-in. swing over the bed or saddle wings, 1⅜-in. hole through the headstock spindle, and 1-in. collet capacity. The optional handlever operated cross slide is furnished with front and rear tool blocks which provide positions for three tools. A quick change gear box supplies 48 longitudinal power feeds for the universal carriage, 48 power cross feeds for the compound rest cross slide, and 48 thread cutting feeds. The handlever operated bed turret indexes automatically and has an adjustable stop for each of the six turret tool positions. The underneath motor drive and back gears deliver 12 spindle speeds ranging from 50 to 1357 r.p.m. The lathe is available either with or without coolant equipment.

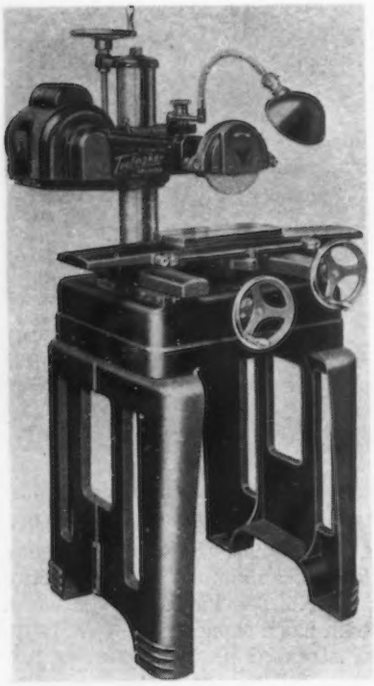


Hand Screw Machine

THE *LOGAN ENGINEERING CO.*, 4901 Lawrence Avenue, Chicago, announces the production of its No. 830 hand screw machine which has a capacity of ⅝ in. round bar stock. This lathe enables producers to arrange a more economical set-up by releasing their existing equipment for heavier work. Features of design and construction include: Precision ground bed with two prismatic V-ways and two flat ways; precision, pre-loaded ball bearing spindle mounting; turret holes are bored from headstock; turret and cross slide are provided with adjustable gibs to compensate for wear. The entire machine is built to rigid specifications. A new speed collet chuck for handling round work which may be fed through the spindle and a bar feed attachment are offered as accessories.

Surface Grinder

A NEW type surface grinder has been announced by the *Delta Mfg. Co.*, Milwaukee. The wheel-mounting arrangement utilizes a two-piece adapter, so that either wheel, or wheel or adapter, can be removed, permitting a wheel to be removed and replaced with the adapter without any further truing. Spindle is made extra long with widely spaced bearings at either end. The forward bearing is a taper bronze bearing, with take-up provided. The rear bearing is a sealed ball bearing. The table has long ways so that it never "hangs" over the end of the machine. Wheelhead is carried on a specially designed column. A steel gib guides the bracket yoke so that it is always in alinement, and bracket may be ro-



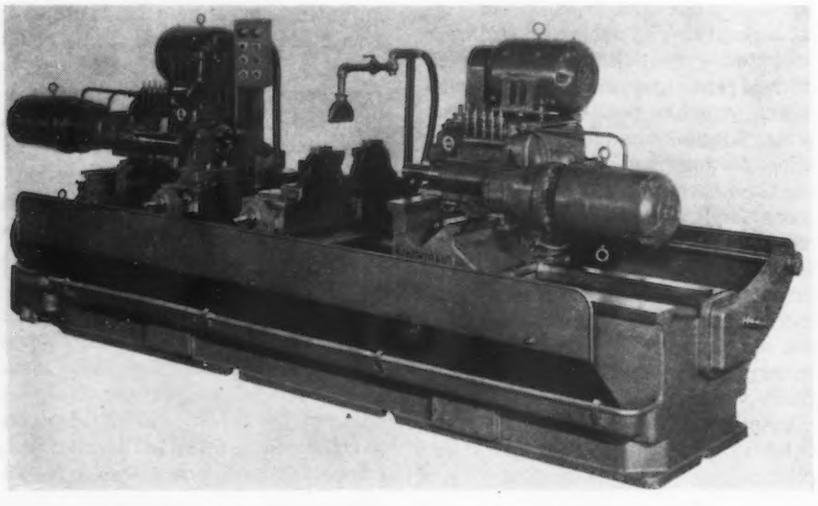
tated 360 deg. Specifications are: Maximum space under 7 in. wheel, 9½ in.; table surface, 5¾ x 13 in.; minimum diameter cup wheel with standard guard in place, 3½ in.; maximum diameter wheel, 7 in.

Double End Milling and Centering Machine

THE SUNDSTRAND MACHINE TOOL CO., of Rockford, Ill., has recently put into production a new double-end milling and centering machine suitable for milling to length and centering (in one handling) both ends of shafts ranging from 1⅛ in. to 6 in. diameter by 14 to 72 in. long. Crosswise to the bed ways are mounted two sub-bases which, in turn, have ways on which cross feeding heads are attached. The left-hand sub-base is fixed but the right-hand base is adjustable for handling various lengths of stock. Mounted to the bed ways between the two heads are two screw operated self-centering vises for holding the work. The operator loads a shaft into the work holding vises, presses the cycle control button which starts cross feed of the heads towards the front of the machine to mill the both ends of the part to length. At the completion of the cross feed for milling, the heads rapidly return towards the rear of the machine until the centering spindles are in correct position and then stop. The centering spindles automatically travel longitudinally in a cycle of rapid approach, feed, rapid return, and stop. The cycle is completely automatic so that one operator can run several machines. Electrically operated vises can also be provided to further simplify loading and unloading of the work.

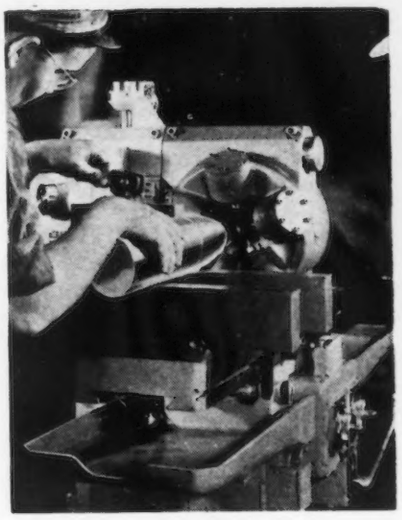
Thread Milling Machine

THE WALTHAM MACHINE WORKS, Waltham, Mass., has made several changes in design on their thread millers. The most important change in the improved design is in the use of three motors. It allows individual speed change and reverse for both the cutter and the work and a constant speed for the pump. The machine is best adapted for work with a diameter of 2 in. or smaller. An 8¾ in. thread may be cut if work is held on centers. Diameter of the hole through spring chuck is ⅝ in. Various attachments increasing the usefulness of the machine are available and it can be arranged for cam operation.



Multiple Spindle Head

A NEW multiple spindle head for simultaneously milling a number of staking notches in shell noses has been placed on the market by *Kent-Owens Machine Co.*, Toledo, Ohio. The illustration shows a five-spindle head which mills all five staking notches in a shell at the same time. This method multiplies production over the former method of milling one notch at a time. The fixture shown is designed so that the shells are rolled on to it from an adjoining conveyor, are notched and then rolled back on to the conveyor. This unit can be adapted for use on either a Kent-Owens No. 1-8 machine with hydraulic feed to the table or the No. 1-M with hand feed.



Multi-Speed Pedestal Grinder

THE STANDARD ELECTRICAL TOOL CO., Cincinnati, has added a multi-speed grinder to its line. This machine incorporates speed-change construction but has the added advantage of being able to receive wheel stubs from larger machines which were formerly discarded. This grinder permits wear of a 12-in. diameter wheel to a 5-in. diameter, maintaining the peripheral speed throughout the life of the wheel. The ball bearing, totally enclosed motor is mounted on an adjustable plate on back of the pedestal with power being transmitted through multiple V-belts. Safety guards are of the hinge door type, each with an exhaust outlet, adjustable spark breaker, and work rest. An inter-locking arrangement prevents overspeeding of grinding wheels.

What the clock manufacturers are making would alarm Hitler

Alarms and other clocks may not be as plentiful as they once were . . . although it is believed there will be enough for every war worker. But fewer clocks, and fewer everything for civilians, is good news for Americans because it is the worst of news for Hitler.

In converting production facilities from clocks to war essentials, manufacturers were able to overcome new problems easily and quickly in cooperation with the Revere Technical Advisory staff. For in all problems of copper and its alloys, Revere supplies a service, in addition to sound metals, that helps untie the knots of processing and fabrication.

Every ounce of copper our country can produce goes directly into war essentials. Fortunately, Revere is well equipped, with modern plants, improved machines and advanced techniques, to assume a heavy responsibility in meeting critical needs. And Revere research is continually uncovering new knowledge about copper to help make our arms more swift and sure.

The Revere Technical Advisory Service functions in (1) developing new and better Revere materials to meet active or anticipated demands; (2) supplying specific and detailed knowledge of the properties of engineering and construction materials; (3) continuously observing developments of science and engineering for their utilization in production methods and equipment; (4) helping industrial executives make use of data thus developed. This service is available to you, free.

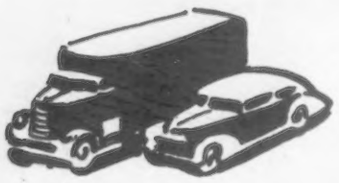
REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

EXECUTIVE OFFICES: 230 PARK AVENUE, NEW YORK

Assembly Line . . .

• Auto companies look askance at Controlled Materials Plan; fear overwhelming volume of paper work . . . Output of Continental Motors will again increase.



DETROIT — Reaction of the automobile industry to the new Controlled Materials Plan is mixed, dominated mainly by disappointment and some fear that the paper work involved may prove an insurmountable obstacle to proper administration of the plan.

Relief is naturally expressed that the scheduling of production has finally been geared to the output of basic materials. But on the other hand, it is feared that the War Production Board has, in adopting the bills of material philosophy advocated by automotive companies, made such a complicated structure that administration will be extremely difficult.

As the plan stands, prime contractors have to deliver to Washington bills of material which cover requirements right down to the last ounce of each minor sub-assembly. The auto people feel that it will be all but impossible to obtain detailed materials requirements from their sub-contractors. Many of these sub-contractors, it is pointed out, are extremely small shops in a good proportion of which there are absolutely no facilities for bookkeeping or materials control beyond very general levels. The job of obtaining detailed materials requirements from such sub-contractors appears an immense one.

Fortunately the Controlled Materials Plan makes allowance for estimating to some degree; and there is frank opinion with auto companies that a very large share of the bills of materials which must first be submitted next January 1 will be largely based on estimation. In support of this belief it is pointed out that one company set out about a year ago, at the request of WPB, to ascertain the amounts of materials going into its automobiles. The job took several months and cost an estimated $80,000. This work is viewed as comparatively simple as against the research necessary to break down some of the larger pieces of armament, such as tanks, into their component materials.

Word within the industry also is that the WPB processing section will have to be tripled in size from the present staff now processing PD-25 applications, in order to administer the new program. Fears are expressed that the WPB will not be able to locate sufficiently qualified men in the numbers required to handle this program.

The new Controlled Materials Plan will also impose difficulties growing out of constantly changing specifications. In one instance within the last few weeks one company was said to have received no less than 67 different engineering changes in one day on the piece of equipment on which it was working. Every change of this sort, however minor, will necessitate a reappraisal of the quantities listed in bills of material. The labyrinthine character of supplying the government with the figures it will require is quite obvious.

THE work of gathering supplemental bills of materials from sub-contractors appears likely to fall into the hands of expediters now employed by the companies to see that production work in subsidiary manufacturing plants goes forward. These people, in constant contact with sub-contractors, appear logically slated to take on the work of pushing through the supplemental bills. Whether they can impel the action necessary to make this system work is today a moot question.

It might be added that there is a wave of irritation against the steel companies growing up within the automobile companies as a result of such incidents as the genesis of the Controlled Materials Plan. This plan is basically built on the one advocated by the Iron and Steel Branch of WPB, developed by the steel industry. The auto people feel that they, as customers, should have had at least the courtesy of a consultation before the Iron and Steel program was submitted. The steel companies as suppliers and the automobile companies as purchasers have always had differences; it would be no surprise to find added examples of friction cropping out in the future, also based on lack of liaison between the two industries.

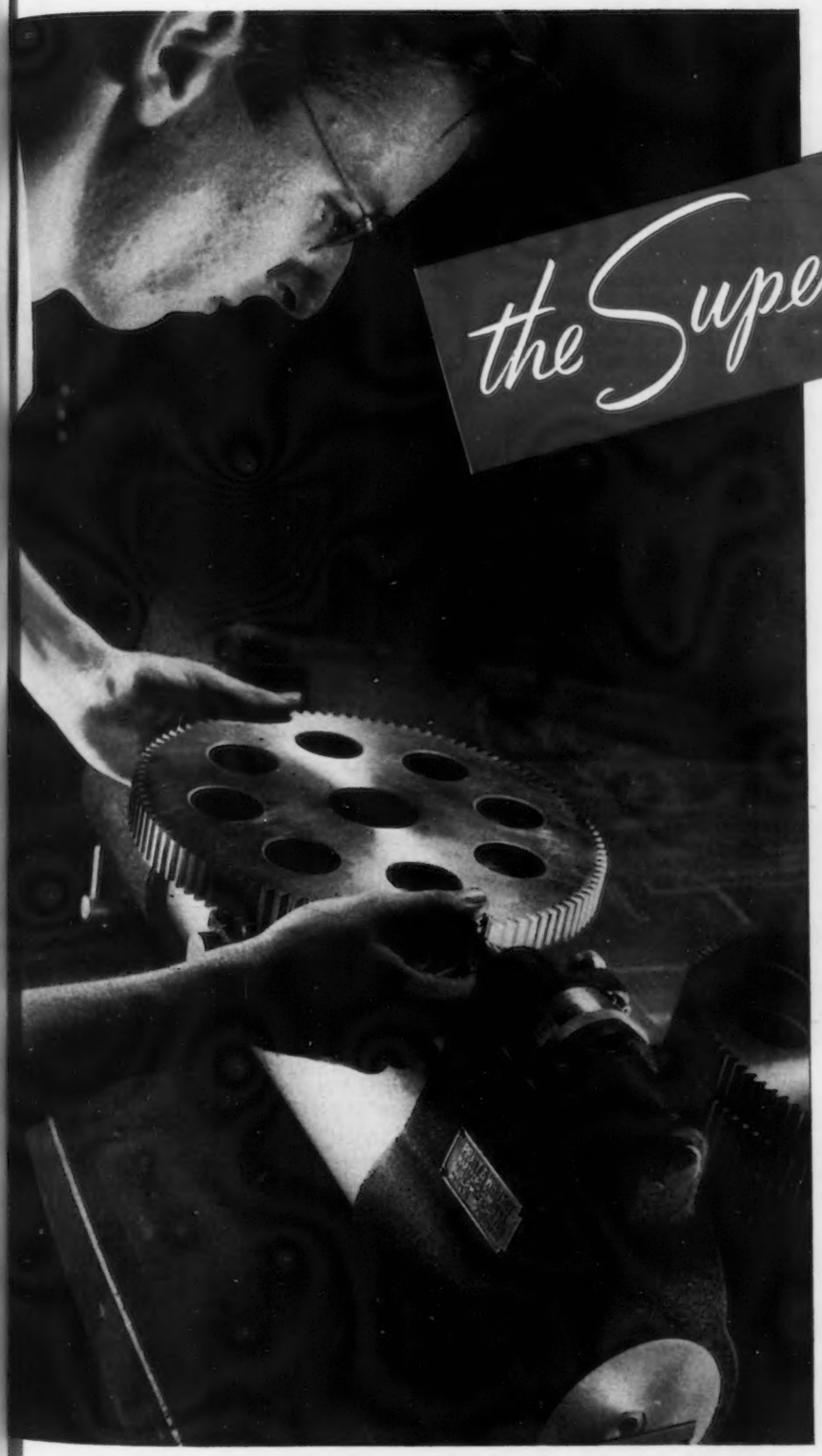
ON the production side, considerable interest is building up today in the job done by Continental Motor Corp. on war work—a job which has been but moderately appreciated up to now. It probably will be startling news to report that Continental is the largest producer of engines by quantity in the United States, and that it is the third largest producer by horsepower volume.

On top of that record, Continental is now preparing to enlarge its output quite considerably. It can be said that during the next year employment will come close to doubling its present levels. Present floor space and facilities being used will also come close to being doubled The bulk of these increases grow out of Continental's taking over engine production facilities in Texas originally developed for Guiberson Diesel Engine Co. and out of the erection in Michigan of a new plant for the Continental Aviation & Engineering Co., subsidiary of the parent firm.

The brand new plant which will cost several million dollars equipped, is now in the final stages of construction. This plant is believed the first of its kind to be completed in the war program—built entirely of concrete and wood. It is a factory of most substantial size and the nearest thing to strategic materials involved in its construction consists of the steel channels in the window sash.

This plant will be equipped with some 1200 machines. Some of them have already been moved in and production is underway in one section of the building heated by a railway locomotive. Actual production of engines is expected to begin in this plant early this winter and the likelihood is that capacity op-

He can repeat this measurement to .0001"... and so can you... on



the Supermicrometer

HE'S measuring across wires to check the pitch diameter of this bomber engine gear. He must *know* what it is . . . and he will . . . to .0001". And any man will repeat the same reading . . . without "feel" errors.

For it is measured on the Supermicrometer, one of many Pratt & Whitney products that provide *basic accuracy for mass production.* The Supermike is more than a laboratory instrument; it is a sturdy shop tool, used constantly by operators right at the machine. *Yet it reads with laboratory precision . . . directly to "tenths."* A constant-pressure tailstock gives *all* operators the same reading. The "feel" is *built in.* The job in our photo is a bit unusual. Hundreds of Supermikes are measuring screw thread accuracy in American plants.

If you need basic accuracy for mass production, call on Pratt & Whitney. There is no better-paying investment than the right tool for each job. We'll send descriptive literature on this Supermicrometer if you'd like it.

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Division Niles-Bement-Pond Company

WEST HARTFORD • CONNECTICUT

erations will be reached by late next summer. Production will consist of comparatively high horsepower trainer plane engines and, for the time being, an initial quantity of a new liquid cooled engine developed by Continental.

To enlarge its pay rolls Continental will soon begin to hire women, marking the first time that it has utilized female help in its mushrooming plants. The company's projections are based on surveys of the United States Employment Service indicating that a pool of labor, both male and female, is still available where needed, despite recent substantial hiring.

The size of the Texas Division is at present restricted but only last week Defense Plant Corp. announced a new contract with Continental providing additional plant facilities at a cost exceeding $600,000, bringing the total commitment to several million dollars.

The Texas operation consists of the manufacture of tank engines. It can be said here that the Continental-built Wright Whirlwind radial air-cooled tank engine is finding more and more favor in the eyes of Army officers as tests at home and in the field continue. There is a fair likelihood that this engine will find a wider sphere of operation and use in the near future than it now has.

This engine, although of aircraft type, has been re-engineered to utilize 80 octane rather than 90 octane gasoline and in the reengineering the power was increased. The changes mainly involve the combustion chamber and the ring specifications. Right now a further change is underway—a gradual transition from forged aluminum to cast pistons.

In addition to operating its own plant, Continental now has undertaken the management of the Kinner Motor Co. plant at Glendale, Cal.

In this program of growth mention should be made of handicaps surmounted by Continental to establish itself as a dependable producer. Some of its plants in Michigan were tooled years ago; equipment is mainly of the belt-driven variety. But engine manufacturing was necessary and this equipment was available. Production in volume has developed, proving that a new plant and new facilities are not necessary preludes to war work.

HEIGHT-FINDER: This is the first picture ever released of height-finder manufacture. Similar to the well known range finder it is a stereoptican type optical instrument which accurately measures the distance from the instrument to an approaching plane. This reading, relayed to a mechanical brain, which makes intricate calculations in a split second, produces as an answer the accurate gun setting and range. Instantaneous action and absolute precision is required since high speed planes are only in range for a few seconds. *Harris & Ewing Photo*

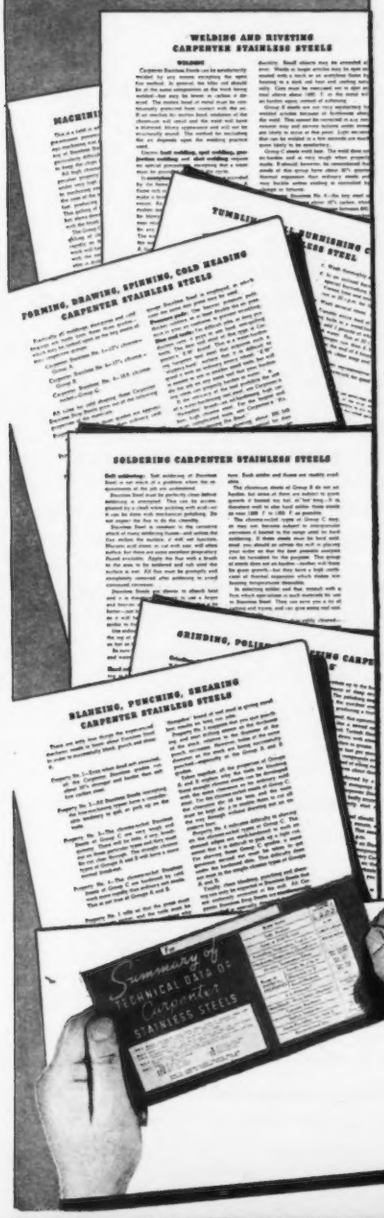
MEANWHILE, changes in policy are in the wind at Army Headquarters in Washington which are likely to affect production planning of Continental and all other aircraft equipment producers. This relates to the ratio of spare parts production. Present Army orders for aircraft engines call for a service part requirement of 30 per cent of total production. There are some indications now that this will be raised to 50 per cent. No reason is given for this change and, as a matter of fact, it appears somewhat mystifying in view of reports current in automotive circles that it has been found possible to lengthen the overhaul period on aircraft motors, due to improvements in engineering design and performance.

The accelerating difficulty of obtaining manpower was dramatized last week in Detroit by two examples.

The Ford Motor Co. announced that it has hired more than 1000 women workers for its River Rouge plant, marking the first time that female help has been engaged in this factory. The women started off with clerical jobs but since that have progressed in the Pratt & Whitney Division to posts in the painting, heat-treat, drafting, metallurgical, chemical, assembly, inspection, stock and engineering departments. Newly hired women are sent to training schools for several days at standard pay and upon entering the shop their pay rates are adjusted to the type of work done. Ford indicated that employment of women would progress to the point where their numbers would practically equal those of the men on the Pratt & Whitney work.

At the same time, the municipally owned Department of Street Railways, following a year of only partially successful recruitment of new workers, announced that women conductors would be hired for the duration of the war as they were during World War 1. Their employment on the street cars will make it possible to move male conductors into motormen and bus driving jobs. It was said that the DSR manpower shortage is "beyond the safety point."

WORKING INFORMATION:


WELDING AND RIVETING CARPENTER STAINLESS STEELS
FORMING, DRAWING, SPINNING, COLD HEADING CARPENTER STAINLESS STEELS
SOLDERING CARPENTER STAINLESS STEELS
BLANKING, PUNCHING, SHEARING CARPENTER STAINLESS STEELS
Summary of TECHNICAL DATA ON Carpenter STAINLESS STEELS

FOR YOUR NEW MEN *who are fabricating Stainless Steel...*

Getting each job done right the first time can save precious hours and days, as well as material that is vital to winning the war.

To help your key men become more familiar with Stainless Steel and various fabricating methods, we offer the Data Sheets described below. These Data Sheets will help to give new workers a better understanding of Stainless Steel fabricating methods. Look over the list below, and check any of the Data Sheets that would be helpful to *your* key men.

Carpenter Stainless Data Sheets

cover the following operations. Each subject is condensed into a single page.

1. Machining
2. Blanking, punching, shearing
3. Grinding, polishing, buffing
4. Forming, drawing, spinning, cold-heading
5. Tumbling, ball burnishing
6. Soldering
7. Welding and riveting

MORE INFORMATION for your key men—and for designers or engineers who are developing new products—is available in this easy-to-use Slide Chart form. The *Stainless Selector Slide Chart* provides information on the analyses best suited for solving various Heat and Corrosion problems. It gives quick answers to questions involving physical properties and fabricating conditions.

A note on your company letterhead will start any of these printed helps on the way to your desk.

The Carpenter Steel Company, 121 Bern St., Reading, Pa.

Carpenter STAINLESS STEELS

BRANCHES AT Chicago, Cleveland, Detroit, Hartford, St. Louis, Indianapolis, New York, Philadelphia

Washington . . .

• Under new Controlled Materials Plan, the government will decide what it wants from industry and when it wants it . . . Reorganization of agencies will be necessary . . . Government will keep books.

WASHINGTON—At the press conference at which the Controlled Materials Plan was announced, most of the discussion centered around a technical description of the plan. In desperation, a reporter asked Donald M. Nelson, WPB Chairman, what the plan meant to the man in the street.

Mr. Nelson mildly replied that it would mean that materials would be properly distributed. On further questioning, he said that more ships, shells, guns, tanks and planes would be made because the new plan would tend to prevent the useless chewing up of materials through unbalanced production of components.

This is the story that has been carried to America. But if the plan works, and there is every evidence that an honest effort is going to be made to make it work, the setting up of CMP is more significant than the headlines have said.

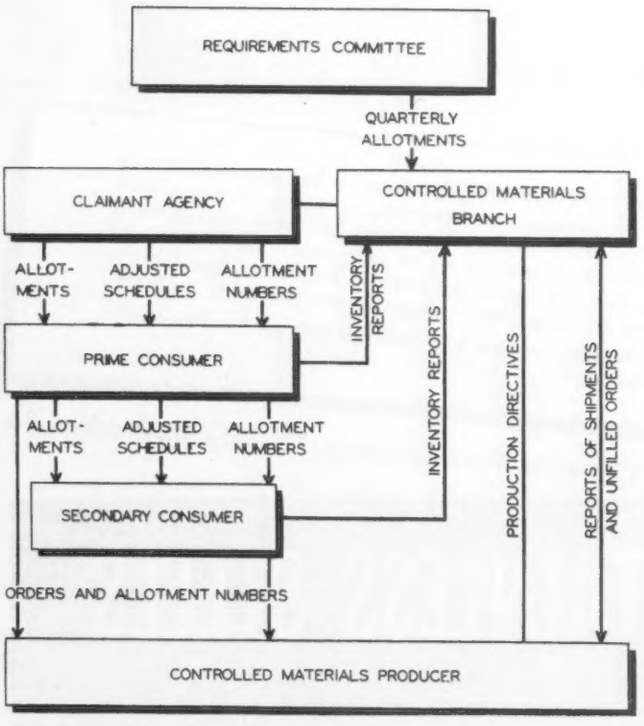
"To little and too late" has had its roots in the jurisdictional fight between WPB and the Army and Navy for control over materials. This fight is ended with the merging of the controls in the hands of Ferdinand Eberstadt, WPB vice-chairman on Program Determination, and former chairman of the Army and Navy Munitions Board.

The bureaucratic scramble for power beside breeding disgust for Washington in the minds of millions of Americans, sabotaged the sickly priorities system by puffing hundreds of thousands of excess orders into existence, and for which there was naturally no material. Vertical rationing promises to end the dangerous fumbling with production and to bring the beginning of industrial mobilization.

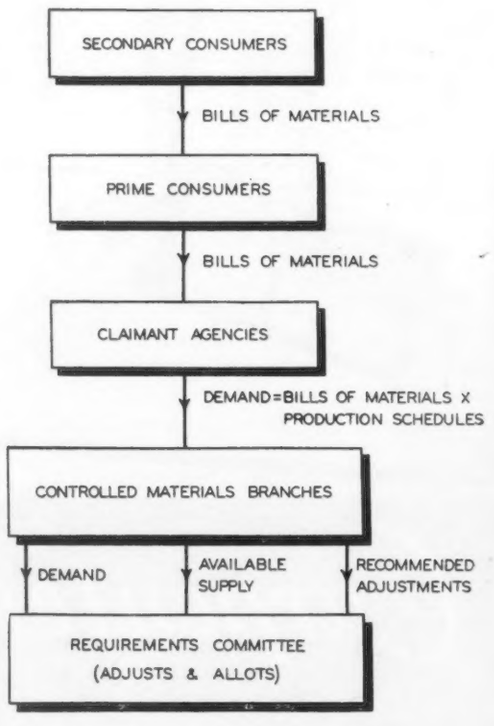
BEFORE CMP there was no real planning of the military program. CMP attempts to remedy this failure by compelling the armed services and the other claimant agencies to program ahead for 18 months. The result of this programing is that it will furnish the basis for the discovery of requirements. Once requirements are found, war plant expansion or curtailment can be intelligently undertaken. The matching of material supply and demand will be made possible when accurate account of material authorization is kept.

All this means the saving of thousands of man hours in government bureaus connected with the war effort, since it can be said that efforts to make the priorities system work have been largely wasted. Taxpayers will benefit since plant expansion of all kinds to produce munitions have been projected without knowing how many were needed nor how much

FLOW OF ALLOTMENTS FOR SUPPLY



FLOW OF REQUIREMENTS FOR DEMAND



YOUR REFRACTORIES SERVICE MAN ...THE BASIC FIELD ENGINEER

As steel furnaces continue to operate at or near capacity, refractories are subjected to greater strain and faster wear. Thus good refractories, properly applied, are increasingly important to the steady, efficient production of open hearth and electric furnace steel.

To the men who operate the furnaces—men successful in meeting production problems with ability and judgment—we offer the assistance of a staff of trained engineers, capable men to service good refractories.

Basic Field Engineers are, first of all, experienced steel men. From years of work with the open hearth they know the practical side of steel making. They also know refractories. Their specialized training and knowledge enable them to tell how refractories will act under variable conditions.

You, as a busy open hearth or electric furnace operator, can confidently rely on the Basic Engineer as your refractories service man. His job is to supervise and assist with the installation of new hearths, major repairs and special applications. In fact, there may be numerous situations on which he may be able to advise you so as to reduce delay time and lower refractory costs.

Call upon this Basic Engineer whenever you have a refractory job to do. He is anxious to help you get maximum production out of your furnaces.

MAGNEFER—Dead-burned dolomite for hearth and slag line maintenance.

SYNDOLAC—Dead-burned, rice size dolomite for maintenance.

BASIFRIT—Quick-setting magnesia refractory for new construction, resurfacing and maintenance.

OHIO MAGNESITE—Domestic dead-burned high-magnesia grain refractory, equal to Austrian.

695 PLASTIC—Strong plastic basic refractory for hot and cold repairs.

RAMIX—An air-setting, time-saving basic refractory for rammed hearths and cold repairs in open hearth and electric furnaces.

GUNMIX—A basic refractory with chemical bond, sized for use with a cement gun.

HEARTH PATCH—For deep hole patching and other quick repairs in the basic open hearth.

RAW DOLOMITE—Washed open hearth dolomite in rice size and standard ⅝-inch.

BASIC REFRACTORIES INCORPORATED

FORMERLY BASIC DOLOMITE, INC.

CLEVELAND, OHIO

material would be consumed. This bungling is to end, The chances that billions will be wasted in plants for which there never can be any material available for processing, or the waste of more billions in plants which will never be completed, are diminished by the provisions of CMP.

The confession of failure of the priorities system which WPB made at the conference cannot but generate more confidence in the direction of the war. Automatically, the acknowledgment of error and the promise of correction of that error heightens trust because people respect those who admit they are wrong and try to make amends. It is axiomatic that honesty in government is never a mistake.

HELTER skelter war administration has caused threat of plant shutdowns, labor dislocation, artificial shortages, material hoarding, loss of morale and has endangered the lives of fighting men. If the old order had continued the loss to the country could not be computed in money.

Naturally, WPB and all of the government agencies connected with the war will have to be completely reorganized to fit themselves to handle the new plan. The armed services will require new staffs of men from industry. Industry will have to develop personnel to handle the new responsibility delegated to it to develop bills of material and the allocation of material to its subcontractors and suppliers.

Contrary to early newspaper reports that the plan is so complex that it is not understandable in all of its ramifications, it is composed of the same elements as business itself. Planning and scheduling production are nothing new. Every manufacturer knows fairly well how much material it takes to make his product, how much inventory he needs for seasonal demand, and how many men and machines he must have to meet his commitments.

THE government is going to decide what it wants from industry and when it wants it. Industry is to inform government how much material is needed for the government's requirements and how much can be produced. The government is going to keep books and thus maintain its demands within industrial capacity and material supply.

Claimant agencies under the plan are: War, Navy, Maritime, Aircraft Scheduling Unit (agent for Army Air Forces and Bureau of Aeronautics) Lend-Lease, Board of Economic Warfare and the Office of Civilian Supply.

All manufactures have been divided into Class A and Class B products. Class B products whose demands are taken care of by the Office of Civilian Supply as the claimant agency are items normally sold on the open market and those subassemblies or miscellaneous or specialized items of equipment for which individual, specific allotments from claimant agencies to prime consumers and from prime consumers to secondary consumers are deemed impractical. Class A products are the products needed by the claimant agencies other than the Office of Civilian Supply.

THE following is a list of Class B products comprising Exhibit II of the Plan:

Agricultural machinery and equipment; air conditioning equipment; batteries; bearings, ball and roller; bolts, nuts, rivets, screws and washers; blowers and fans, blast, blower type, exhaust drying, forced draft and industrial dust collecting apparatus; communication equipment; compressors and vacuum pumps, reciprocating, centrifugal, turbo-blowers and rotary; condensers, steam, including surface, jet and barometric; construction machinery and equipment; consumers durable goods; containers; electrical apparatus for internal combustion engines, fasteners, textile and leather; furniture; general industrial machinery other than components of Class A products, including elevators, conveying equipment, industrial trucks, etc.

Generators, electric; hardware; health equipment and supplies; heat exchangers; instruments for indicating, regulating and recording temperature, pressure flow; liquid level; humidity, movement, time and electrical quantities; machine tools and metal working machinery; mining machinery and equipment; motors, electric; and motor generator sets; office and service machinery; petroleum machinery; piston rings; plumbing fittings and supplies; plumbers specialties such as fixture fittings and trim; plumbing, heating and cooking equipment; power boilers and auxiliary equipment; power equipment and public utility equipment including electric, gas, water, central heating and other public utility apparatus, and equipment; pumps, power driven except measuring and dispensing pumps; refrigeration, commercial and industrial.

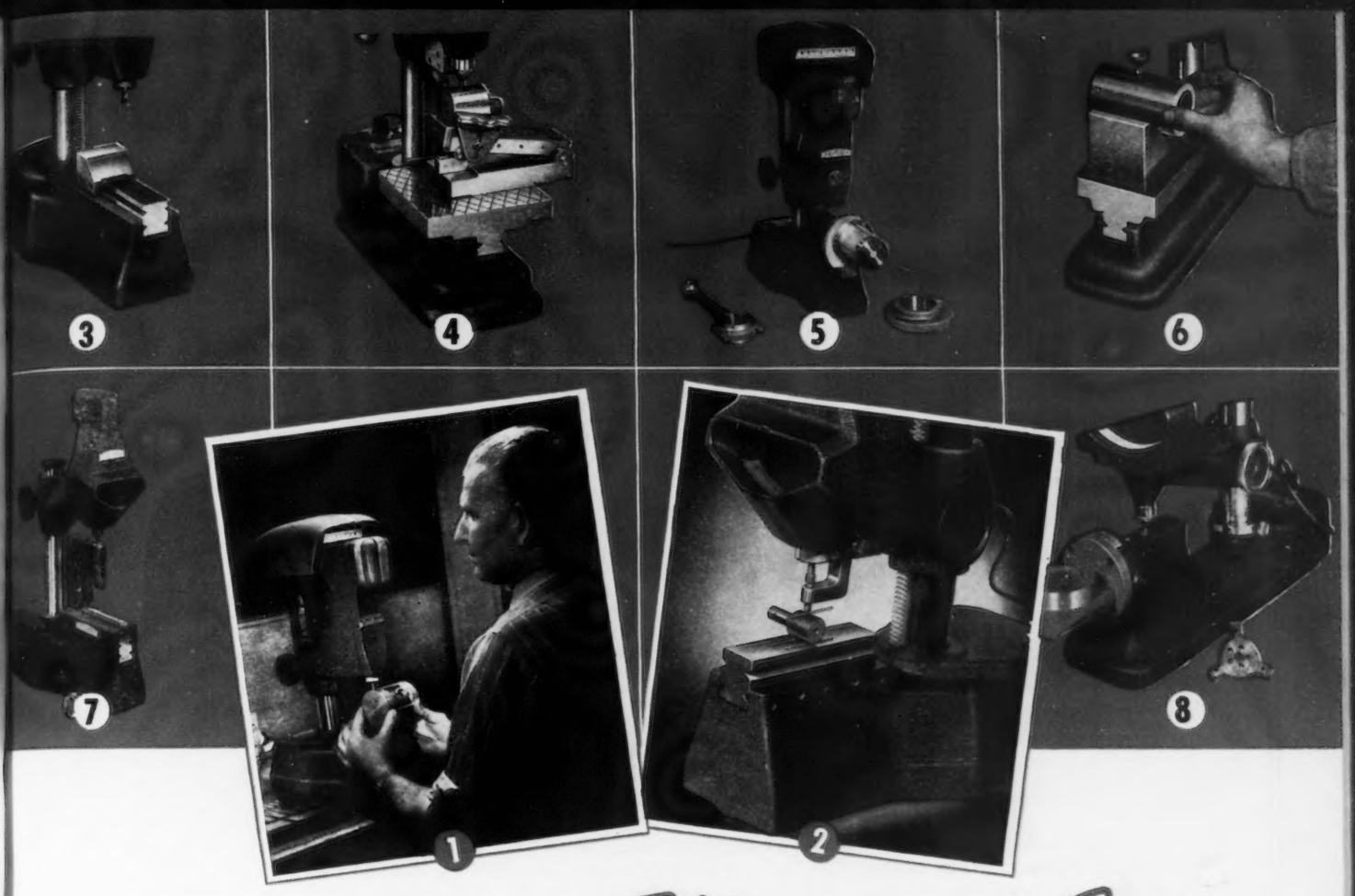
Safety and technical equipment; spark plugs; special industry machinery, including food machinery, rubber working machinery; wood working machinery, etc.; switch gear, panelboards, switchboards, motor controls, switches, circuit breakers and other electrical control equipment and accessories; transformers; transportation equipment (including automotive); turbines, land and marine; valves; welding rods and electrodes; wiring devices and supplies, including electric fuses and pole line hardware and insulators.

The foregoing list of products for which OCS is to be advocate before the Requirements Committee are the products which WPB will directly control through the issuance of allotments of controlled materials through its in-

(CONTINUED ON PAGE 129G)

THE BULL OF THE WOODS — BY J. R. WILLIAMS

NO SIR, I NEVER RUN NO MACHINE BUT A HASH MACHINE AN' A SAUSAGE GRINDER-- I WORKED CLOSE TO A DRILL PRESS ONCE BUT I NEVER RUN ONE
BUT DIDN'T YOU NOTICE HOW TH' DRILL PRESS WAS OPERATED? DON'T YOU REMEMBER SOMETHING ABOUT IT? CAN'T YOU RECALL--UH
TIME WAS NOT SO LONG AGO WHEN THEY TRIED TO MAKE A MACHINIST IN THREE TO FOUR YEARS -- NOW----
NOW THEY TRY TO MAKE 'EM IN ONE INTERVIEW
HEROES ARE MADE NOT BORN
J.R WILLIAMS 11-13
T. M. REG. U. S. PAT. OFF. COPR. 1942 BY NEA SERVICE, INC.



ARE YOU GETTING *Maximum Service* FROM YOUR VISUAL GAGES?

1 Equipped with plain and serrated anvil for the checking of width, thickness, height, or outside diameter.

2 Equipped with flat anvil and thread wire attachment for checking pitch diameter of screw threads.

3 Equipped with standard backstop for accurate and rapid positioning of work being gaged.

4 Equipped with wide anvil and Sheffield sine bar fixture for the checking of tapers.

5 Equipped with Sheffield Internalgage for the checking of inside diameter, taper, and out-of-round.

6 Equipped with wide anvil and V-block for checking outside diameter of cylinders and bushings.

7 Equipped with fixture to check ball diameter of an inner ball race.

8 Internalgage with fixture to check a depth.

The Sheffield Visual Gage is used for many purposes. If you are not familiar with all of them, the outline here may suggest a means of increasing the effectiveness of your gages and the variety of work they do.

Sheffield Visual Gages are used:

In the Inspection Department

For the final inspection of close tolerance manufactured parts.

For the classification of such parts as the basis for selective assembly.

In the Tool Room

To check fixed size gages for wear.

To check precision gage blocks for wear.

To check the dimensional accuracy of tools.

In the Production Shop

To provide machine operators with an accurate check on work in process.

In the Receiving Department

To check dimensional accuracy of purchased parts and sub-assemblies on arrival.

In the Laboratory

To provide maximum accuracy for measurements of all kinds.

THE *SHEFFIELD* CORPORATION

DAYTON, OHIO, U. S. A.

WEST COAST . . .

• Mail order government irks business men of Far West, who often are unable to obtain needed WPB documents . . . On the other hand, Services of Supply have enhanced their prestige by keeping in touch with local conditions.

SAN FRANCISCO — Taxation without representation never has been a complaint of the Far West, a region which has always paid little taxes and elected herds of sage brush senators.

For the past year, however, since Federal war agencies gained absolute control over the destiny of business and industry, equally fertile seeds for secession have been nurtured in West Coast business communities by the mail order government which fills orders only at Washington, D. C. Mail order government, in itself, would not have contributed so heavily to the far western colonial complex if the mail and the order fillers were as rapid as when the Sears catalog climbed the social ladder from the outhouse to the parlor table. But with the mails swamped, and with the Washington, D. C., order takers fully occupied with inter-office struggles the orphaned western business man is faced with the necessity of beating his own way, and hoping that law and regulations, bushels of them, are on his side.

To demonstrate how completely oblivious the War Production Board is of the little business man out West, for a period of two weeks recently, the San Francisco priorities office was unable to fill requests for form PD-1-A, the basic universal document on which the ordinary citizen pleads for one-shot priority assistance to buy anything from aluminum accessories to zwieback. The local supply of these forms simply was exhausted, and some local citizens were so unkind as to suggest that possibly Washington, D. C., was purposely taking a rest from considering any more requests from the colonies.

To this day, WPB Order M-21, which is the basic document restricting and regulating the iron and steel industry, is not available from the San Francisco regional office.

TO secure permission to purchase heavy air compressors, essential to heavy construction and mining which thrive in the far West, the prospective purchaser must do as home work a lengthy set of questions known as Form PD-415, and send his answers into Washington, D. C. The San Francisco WPB office, which is theoretically the control point for the entire Coast, hasn't had Form PD-415 to give out for months, but if the poor Californians want compressed air bad enough, they are privileged to sit down and copy the questions off of a master file.

The Office of War Information recently publicized a request that the good people in far parts of the country rely upon the newly "decentralized" war agency offices for information and blanks. Yet one WPB branch which by a quirk of nature drums up most of its business west of the Great Plains, recently decided that an application form, valueless in itself, on which to request priority assistance, could only be distributed by the superior minds of the nation's capitol, according to applicants who tried to secure it locally. The same department airily informs its patrons, most of whom are located miles from civilization, that if they require emergency priority assistance, they must ring a certain District of Columbia telephone number. This far-fetched misunderstanding of the locale in which the paying customers work is only topped by the failure to realize that, even for the boys in town, success in finding a free line to Washington compares in luck with picking the winner of the Backlash Teachers-North Central State football game to chalk up 20 winners in the weekly football pool.

Such major hardships and worries result in hardy Westerners regarding the actual filling out of forms, questionnaires and reports, as child's play, although one aircraft plant making an occupational study, discovered that 18,000 man hours yearly were spent by its employees in answering questions for Uncle Sam.

Early this year, when Donald Nelson announced that WPB would be decentralized by creation of regional organizations throughout the land, Washington bureaucrats were warned that regional directors would be given sufficient power to break the stranglehold of bureaucratic centralization in the nation's capitol. That, in itself, should have been sufficient to dispel the notion that the magic potion could be brewed only in witches pots bearing the union label, "Made in Washington, D. C."

In the extreme cases, where the exclusive District of Columbia club has lost complete touch with the far parts of the country, except for a few "get-acquainted" tours in which busy business men are dragged from their work, it is increasingly evident that regional managers of both WPB and OPA intend to take matters into their own hands and create parallel organizations to those at Washington, D. C., but with purely local responsibility.

PARALLEL to the forced ascendency of regional administration probably will be greater responsibility for the Army Services of Supply. Batted down at the capitol, the Services of Supply have increased their prestige tremendously in the far West by the simple expedient of keeping in close touch with local conditions and by acting quickly and effectively.

First serious proposal that white collar occupations be placed on a part-time basis to enable employees to work in war industries came last week from Leonard Maloney, recently appointed employment manager of Consolidated Aircraft Corp., San Diego. Maloney suggested that banks, stores and professional offices as well as other service occupations, close three days a week so that San Diego's aircraft factories might add to their badly depleted pool of employables.

Consolidated currently is undertaking a job evaluation survey to determine where physically handi-

. . . increases life of seal rings 800%

In addition to increasing output 200% to 600%, TOCCO Induction Heat-Treating enables designers to improve machine parts for *longer life* and *lower cost*.

These TOCCO-hardened tractor seal rings for example: Formerly used castings plus packing type of seal. Required considerable grinding to finish.

Now use soft material (about 20 R.C.)—machine the seating surface to close tolerance—then TOCCO-harden only seating surface to 56-60 R. C. and give it a quick, final grind. Eliminates need for packing seal. Wearing surface is harder, resulting in 8 to 10 times former life. Simplified design cuts production time and cost.

Investigate TOCCO as a means of improving *your* products, boosting output and cutting cost!

THE OHIO CRANKSHAFT COMPANY • **Cleveland, Ohio**

TOCCO

World's Fastest, Most Accurate Heat-Treating Process

HARDENING
ANNEALING
BRAZING
HEATING for
forming and forging

capped persons can be used in aircraft production. Consolidated has already recognized as employables, one-armed, one-legged and partially paralyzed job applicants who have been assigned to special tasks. Consolidated also recently abandoned its age limit of 65 on job applicants.

Years of controversy as to the coking properties of Pierce County, Washington, coals will be partially settled at least by erection of coke ovens near Tacoma. Supported by RFC funds, the plant has an initial capacity of 200 tons per day. The coking qualities of Washington coal have been substantiated many times on a laboratory scale, but industrial research invariably has indicated that cost factors would make commercial scale production impractical.

A NEW attack on the 40-hour basic work week has been made by the California State Chamber of Commerce in an eight-point program offered as an alternate to labor conscription. Opposition to the 40-hour week on the Pacific Coast has come not so much from prime contractors for war equipment, who willingly pass the cost of overtime along to the Government, but from sub-contractors and industries not directly supporting the war. The prime complaint of these latter groups is that the chief weapon of the labor pirate has been his ability to offer long hours of overtime, and consequently extremely high weekly earnings One of the chief complaints of the mining industry, for instance, has been its inability, because of fixed mineral selling prices, to hold on to its labor in the face of huge military construction projects and shipyards offering long hours of overtime pay. The State Chamber asked that the United States Employment Service refrain from recruiting war industry workers in rural communities where local agricultural, mining, or lumbering industries are experiencing labor shortages.

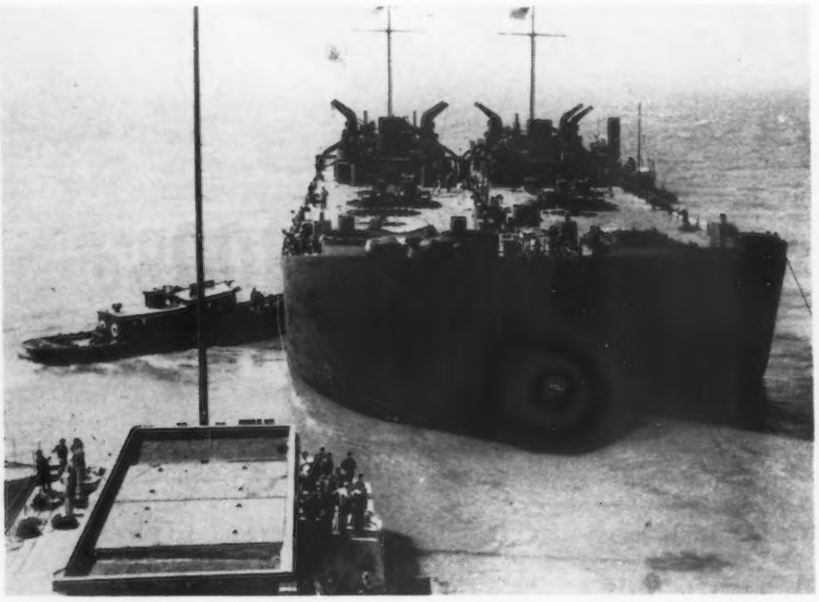
The State Chamber of Commerce failed, however, to attack the basic cause of inter-industry labor migration—disparate wage scales. The War Labor Board award of ten cents an hour increase to employees of the Los Angles Steel Casting Co., which will serve as a bellwether for other southern California foundries, raises the minimum rate in this classification to 75 cents per hour. Unskilled shipyard labor in the same region draws 95 cents an hour, while northern California foundries start workers at 86½ cents per hour.

The current northern California scale was established by the foundries March 1 in an agreement with the molders union. Previously the minimum rate was 72 cents, so that the March 1 increase amounted to approximately 20 per cent.

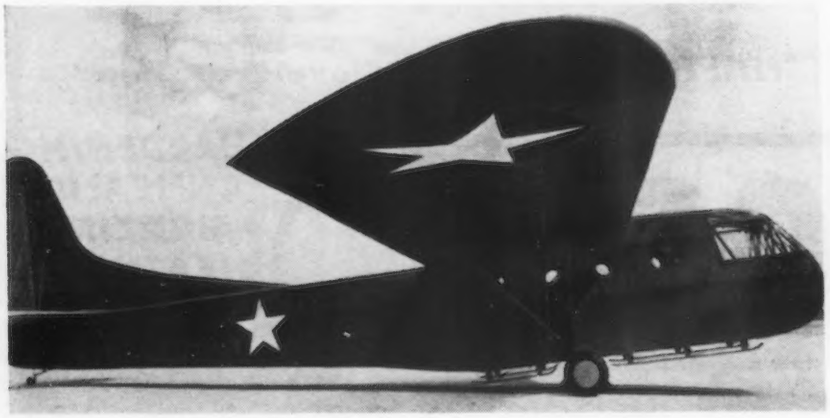
Increased labor costs will present a particularly tight squeeze in operating under OPA Price Regulation No. 244 on grey iron castings, which went into effect Oct. 26. The regulation provides that maximum prices for each seller be established at the highest price for substantially the same casting in effect between Aug. 1, 1941, and Feb. 1, 1942. Because the wage boost came March 1, it is expected that regional OPA offices will be flooded with applications for exceptions to the ceiling price regulation.

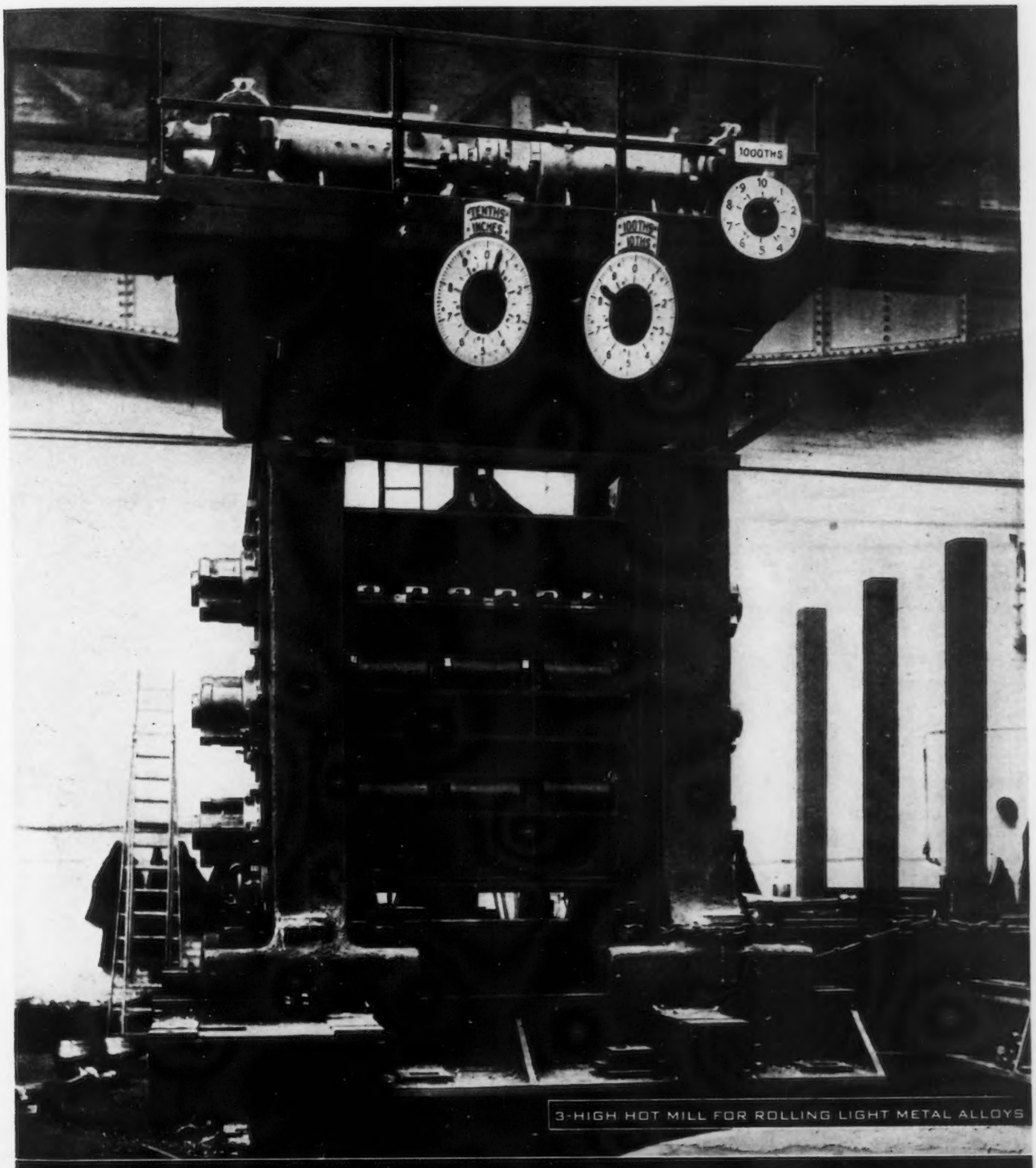
Further incentive for local development is furnished by the three per cent Federal tax on freight and express bills paid for shipments of goods by rail, truck, water and air, which goes into effect Dec. 1.

TANK RUNNERS: The first two of six new tank lighters launched recently at Newport News Shipbuilding & Drydock Co. These ships were built to carry U. S. tanks and trucks to battle areas. Each ship is self-powered and has complete quarters for the crew and troops to man the land vehicles. *British-Combine, Official U. S. Navy Photo*



FORD TROOP GLIDER: This is the first of the Ford-made troop gliders to be completed and is shown ready for testing. In tests the broad-winged, motorless troop carrier came to a perfect landing after a 15-minute glide from 8500 ft. *International News Photo*





3-HIGH HOT MILL FOR ROLLING LIGHT METAL ALLOYS

HYDROPRESS · INC.

ENGINEERS CONTRACTORS

HYDRAULIC PRESSES · ROLLING MILLS
PUMPS · ACCUMULATORS

570 LEXINGTON AVENUE · NEW YORK · N. Y.

Fatigue Cracks BY A. H. DIX

Slacks in Factories

• • • We notice that women in industry are being referred to more and more as "feminine labor". While this is euphemistic, it is not, of course, good English. The correct term is "female labor", for even male labor can be feminine.

We thought of this when we saw this headline the other day in the *Chicago Tribune*, "Packing Sows Command Peak Porcine Prices." Pork prices are not necessarily porcine prices. Prices charged for anything can be, and these days frequently are, porcine, despite the law and the activities of our hero, Leon Henderson. We have never seen ceilings with such a high elastic limit.

Ear Drums' Delight

• • • While on the subject of words and phrases that caress the ear, Tom Lippert, your favorite family journal's m'g'g ed., encircles this English legal term in an English industrial journal — "frustration of contract." We think it deserves equal billing with our favorite, the engineering term, "Angle of repose."

Your Chicago periscope, Bill Phair, a coming Magellan, contributes a navigation phrase which, although only so-so in euphony, is 20-20 in impressiveness. It is "area of perpetual apparition," and applies to the polar areas, where there is light much of the year around.

Il Duce Cooks Up Another

• • • Mussolini, we see, has whipped up another slogan for his troops in Libya. This time it is *"Forever forward—We will kick them in the pants."* The sentiment is infantile, the phrasing is inelegant, the timing is bad, and we will not permit our total ignorance of Italian military morale to prevent us from offering to bet a lacuna against a lira that the battle cry acts as a cold compress instead of an electric pad, and that it evokes nothing but the Latin equivalent of Bronx cheers. The get-in-there-and-fight-while-I-stand-here-and-watch exhortation seems to work only when the contestants are strictly amateur.

Close Your Eyes and Swallow

• • • Which leads right into our favorite topic—the use of slogans in industry. Too often industrial sloganeers act like a hypochondriac given free run of the patent medicine counter in a drugstore. Take a swig of everything. Something is bound to help. The danger is that, like unprescribed medicine, the wrong slogan may not only do no good, but may do serious harm. For slogans can be potent quickeners, and can stimulate resentment as well as goodwill.

The phrase that looks like another "Remember the Alamo" from the front office viewpoint may present a totally different face to the man on the night shift who can't get used to sleeping in the daytime, who hasn't had a day off in months, who can't see why the operator next to him should be getting 10c. an hour more, and whose mind is inflamed by talk of swollen company profits.

The smart thing to do, of course, is to find out what the customer, who is in this case the operator, wants, and if what he wants can't be given to him, to make certain that the pep medicine fed to him is free of irritating ingredients.

Double Jigger of Adrenalin

• • • If you don't mind, we will give this chord just one more plunk. Obviously those who work in plants making materials, parts and equipment for war goods should have a far stiffer proportion of war adrenalin in their pep medicine than is necessary in the case of those employed in aircraft, tank, and gun plants. The man who runs a press all day long, knocking out stampings, which are shipped to a plant making altimeters, which are shipped to aircraft plants, relates himself to the war effort only with great difficulty.

He has to be continually reminded that even if his job isn't as dramatic as bolting a 75 mm. on a tank, it is just as essential to winning the war. But it isn't merely enough to tell him. He should be shown the finished product, where it fits in and the job it is doing.

Tailor-Made Morale Builders

The Mattison Machine Works, Rockford, Ill., grinder manufacturer, has the right idea. Throughout the plant, it has posters captioned, *"The Machines You Build Producing Vital War Materials."* On the posters are mounted photographs of Mattison grinders turning out war goods. One photograph, for example, shows an army truck brake drum die being ground. With it are photographs of army trucks on the march. Another shows a grinder finishing mine sweeper rigging parts, and accompanying it is a picture of a mine sweeper at work.

The posters are changed periodically. Of course, it is a lot more trouble to prepare them than to stick up a slap-the-Jap-stun-the-Hun four-color job, but then too, you can get a pair of $60 bifocals tailormade to your astigmatism or a pair of Woolworth's best, which fits the whole family.

Top Line, Please

• • • *And that reminds us to mention something we heard over the radio last Saturday afternoon while tacking insulation between the attic beams. After reading a plug for an optical firm, a WNEW announcer said,, "Our next recording will be 'Your Eyes Have Told Me So.'"*

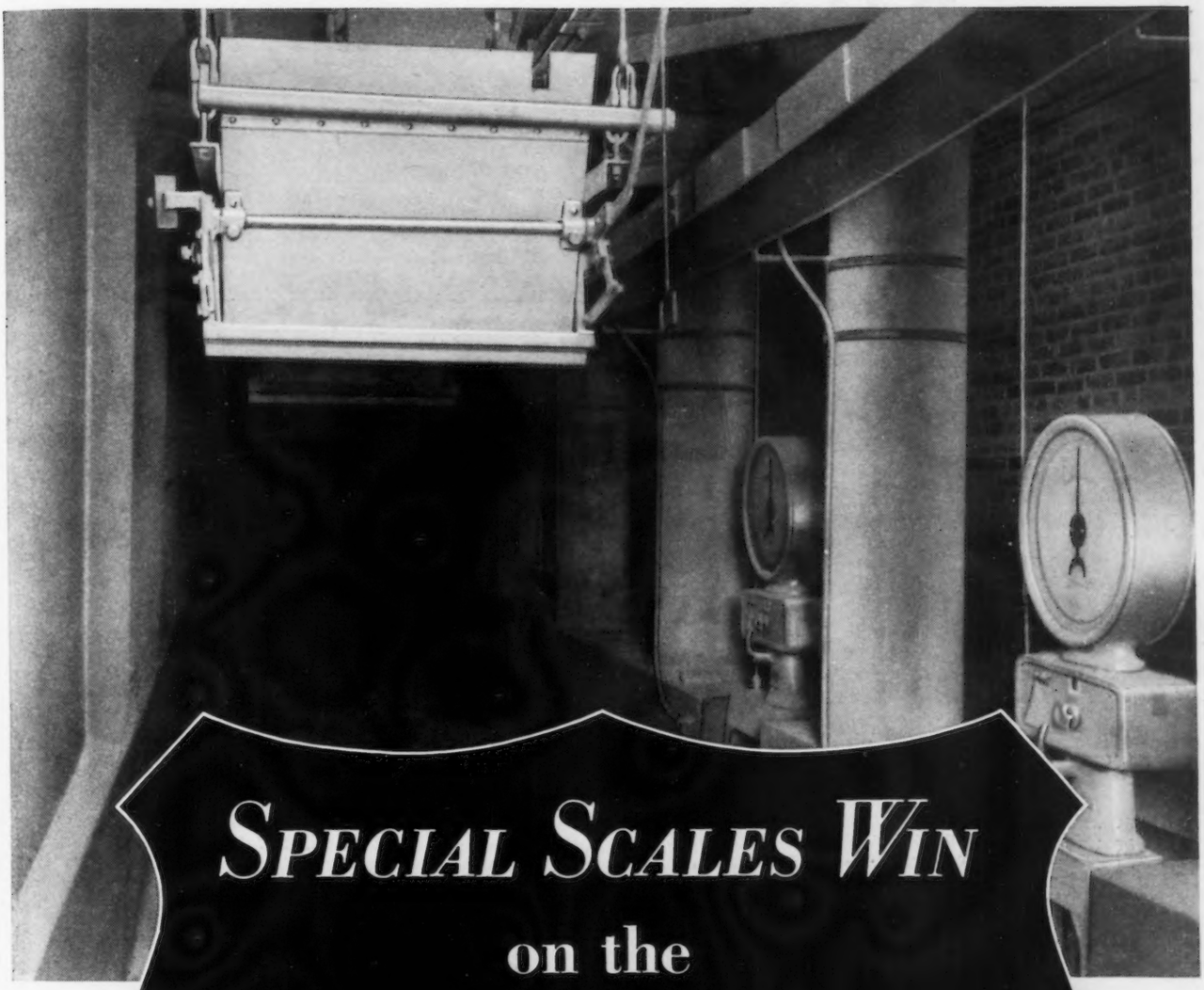
Puzzles

• • • Mates in last week's problem are John and Martha, Jacob and Maude, and Julian and Mary.

L. B. (Bethlehem Steel) Shapleigh shows how to arrange four coins in two rows of three each.

A gentleman who wishes his name withheld, but who is with the Heald Machine Co., Worcester, Mass. says that you can win money if you can get odds on a bet that you won't find at least one pair of matching cards when two 52-card decks are turned over, card by card. You bet say a dollar that there will be at least one matching pair.

Our informant says the chances are even that one match will be obtained. We tried it seven times and got pairs all but twice. We would like to know what the odds are mathematically.



SPECIAL SCALES WIN on the PRODUCTION FRONT

WHERE weighing or batching is required in war industries, special, ingeniously applied Fairbanks Scales speed production. In addition, through their accuracy, they often improve products or facilitate accounting.

This battery of 17 Fairbanks Hopper Scales speeds precise loading of charging cars. Automatic shut-off at any preset weight can be provided.

Let Fairbanks engineers recommend, for purchase by means of your priority, the special or standard weighing equipment which will win . . . now and in years to come . . . on *your* production front. Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Illinois.

FAIRBANKS-MORSE

SCALES
DIESELS
MOTORS
PUMPS

Dear Editor:

THE EMPTY CHAIR

Sir:

If it were possible to reach everyone of the 54 million workers in our country with the plain statements in your editorial, "The Empty Chair," I think we all should then see more clearly the meaning of that great little word, DUTY.

Your editorial is one that appeals to every emotion, in its practical common sense.

We would like to pass it to each of our 1200 employees. Will you kindly advise me if reprints can be made available?

DOUGLAS J. PEAKE,
Vice Pres.-Supt.
Florence Pipe Foundry & Machine Co.,
Florence, N. J.

Sir:

We greatly admired your editorial "The Empty Chair" published October 29, 1942, and would like to have 250 copies, one for each one of us and a few copies for new employees.

F. W. JESSOP,
President
Ohio Electric Mfg. Co.,
Cleveland, Ohio

Sir:

Would it be possible for us to secure about 450 copies of the editorial appearing in your October 29 edition, entitled "The Empty Chair?"

If so, we would appreciate receiving them, and will mail check promptly upon receipt of your invoice.

C. GORDON MacLEOD,
Treas.
Abrasive Machine Tool Co.,
East Providence, R. I.

• Reprints are available at cost.—Ed.

FOOLPROOF GAGING

Sir:

The article "Foolproof Gaging System" has been read with a great deal of interest by many of our people, and we are desirous of obtaining a number of copies. Have reprints in a pamphlet form been made of the article, and if so, what would be the price of them in lots of 25, 50, and 100?

HAROLD E. SCHMETZER
Union Special Machine Co.,
Chicago, Ill.

• Reprints have been made. Price in quantities of 25 or more is 10c each. —Ed.

CUTTING TOOL GUIDE

Sir:

In your October first issue of THE IRON AGE is an article on "How To Select Efficient Cutting Tools" written by Leo J. St. Clair, president of the General Tool and Die Corp. Included in this article is a chart entitled, "A Guide for the Proper Choice of Cutting Tools," which we feel will be helpful to our employees. We are interested in obtaining a copy of this chart and would welcome any suggestions that you may have relative to securing it. Would it come through you or through the General Tool and Die Corp.? If the latter is the case, will you please give us the address of this company as I do not have it and the magazine has been forwarded to someone else in the company.

S. M. BRAH
Rustless Iron and Steel Corp.,
Baltimore, Md.

• We have some, but for quantities write to Leo J. St. Clair, president, General Tool and Die Corp., 555 Prospect St., East Orange, N. J.. No charge.—Ed.

ARC WELDING ELECTRODES

Sir:

If you have any reprints on the article, "How To Select Arc Welding Electrodes," by Mr. Charles H. Jennings, published in your October 15 issue, I would like to have a few.

C. F. PASCOE,
Works Manager
Canadian Car & Foundry Co., Ltd.,
Montreal

• No reprints were made, but we are glad to send some clippings.—Ed.

SIGNAL FLAGS

Sir:

In the October 1 issue of THE IRON AGE, there is a color photograph of Navy men signaling in winter clothing with various signal flags flying.

Is it possible for me to obtain this picture? I would greatly appreciate having one, as my husband was a Naval officer, and lost his life on convoy duty in the North Atlantic.

I am a draftsman at The American Tube Bending Co., doing war work.

MRS. J. R. GILLIE
New Haven, Conn.

PLUG GAGE

Sir:

On page 62 of the Oct. 22 issue is a description of a new type of plug gage, described as an Anti-Friction Plug Gage, patented in England by British Timken, Ltd. We will appreciate receiving from you any information you may have regarding an American manufacturer or distributor of these gages.

W. HOESLY,
Pur. Agt.
A. P. Smith Mfg. Co.
East Orange, N. J.

• Not yet made in this country, nor distributed here, as far as we can find out.—Ed.

GUN DRILLS

Sir:

In an issue of your magazine, which was published some time this last summer, there appeared a feature article on Carboloy-Tipped Gun Drills.

Unfortunately, I cannot say in exactly which issue of your magazine the article appeared, and therefore I am unable to lay my hands upon it. I would greatly appreciate it if you would forward me a copy.

A. M. GRUNER,
Vice President
Genesee Tool Co.,
Fenton, Mich.

• See page 53, Aug. 13, 1942 issue. —Ed.

FOUNDRY BOOK

Sir:

In the Oct. 9, 1942 issue of THE IRON AGE, page 74, we noted announcement of a new publication, Better Foundry Methods, available about Oct. 15.

Is this available now and, if so, what is the price of it?

JANET D. SCOTT,
Librarian
Basic Magnesium, Inc.,
Las Vegas, Nevada

• (1) Yes; (2) $2.50.—Ed.

TUMBLING

Sir:

Some time ago an article was published in your magazine relating to the removal of burrs by tumbling. Could you furnish us with the date of this issue?

J. S. BULMER
Schultz Die Casting Co.,
Wallaceburg, Ont.

• See these issues: Sept. 10, page 47; Mar. 12, page 60; Jan. 22, page 48; and Mar. 27, 1941, page 45.—Ed.

CUTTING TOOL GUIDE

Sir:

We are very much interested in the splendid chart entitled, "A Guide for the Proper Choice of Cutting Tools" in the Oct. 1 issue of THE IRON AGE.

Would it be possible for us to secure some extra copies of the chart itself—possibly 25, or 100 should you have them?

MARY M. SCHULER
Moss-Chase Co.,
Buffalo, N. Y.

BRIQUETTING STEEL CHIPS

Dear Sir:

In the article by the writers, entitled "Cupola Practice with Briquettes" (THE IRON AGE, Aug. 27 and Sept. 3, 1942), we neglected to mention that when steel chips are too light, such as might come from light cuts on automotive work, they are hard to briquette due to the inability to get sufficient quantity into the dies. Our oversight in not mentioning this was due to the fact that we had discovered and corrected this difficulty in the early stages of our briquetting experience.

W. A. HAMBLEY
KENNETH GEIST
Allis-Chalmers Mfg. Co.,
Milwaukee

* **Surge**—the extra stresses which result when the vibration frequency of a rapidly oscillating spring coincides with its natural frequency.

To reduce the dangerous effects of surge, valve springs must be specially designed and carefully fabricated. Rigid tests are equally important, and Muehlhausen engineers use a machine of exclusive design for this purpose. Typical operating conditions are created, and springs are then oscillated at all speeds — from idling to "wide open" motor. At the same time, stroboscopic equipment is used to "stop motion"—and permit visual study at all stages. Thus, any tendencies toward surge are quickly detected.

You can always depend upon Muehlhausen to produce springs of unvarying precision and accuracy. Feel free to check on any phase of spring design, on any type spring—compression, extension, torsion, or flat—hot or cold formed.

MUEHLHAUSEN SPRING CORPORATION
817 Michigan Ave., Logansport, Indiana

MUEHLHAUSEN SPRINGS

EVERY TYPE AND SIZE

FREE! SEND FOR INFORMATION

- New Die Spring Bulletin illustrates, describes 206 sizes and types of die springs.
- New Armament Bulletin shows importance of springs for many types of war equipment.

This Industrial Week . . .

- **Steel More Closely Linked to Strategy**
- **Some Companies Are Stocking Ingots**
- **Hope Seen for "Essential Civilian" Metal**
- **Operations Sag Half Point to 99.5 Per Cent**

STEEL production in the U. S. in the past week has become still more closely linked to military strategy. Inefficiency in channeling steel and other vital metals into the most urgently needed war weapons will less likely be tolerated now that the Nation has started a large-scale invasion certain to develop into a shooting war and great destruction of equipment.

Evidence that the U. S. was entering a more active phase of the war had been apparent in war plants for some months. While it could not be published, information that an attack in force was not far off became particularly evident in the second week of October which saw highly significant diversion in steel distribution.

Opening of the second front in Africa has brought some of the problems of material distribution into sharper focus and places much greater responsibility on the WPB's Iron and Steel Branch, and on other government agencies participating in allocation of materials.

One development, likely to accompany the new war phase, is a closer and continuous review of limitation orders in certain steel consuming industries. Better understanding must be reached at Washington on what constitutes "essential" civilian industries, because a greater share of the Nation's steel production (1,704,000 tons a week) will soon be available for such essential civilian needs.

SOME men in industry now believe that unless much needed steel supplies are sent to railroads, farm equipment plants, container plants and other essential industries severely restricted because of direct war requirements, a curtailment in steel output may develop over the next few months. This does not mean that loosening of steel distribution restrictions will at any early date free metal for non-essential civilian product plants but signs point to some relaxing for the benefit of essential civilian industries.

Here are the reasons given for this development. For the past several weeks some large steel companies have been hard put to work out a pattern which would economically distribute the ingot output to the finishing mill departments. Almost all large integrated steel mills are planned and built so that finishing capacities in the aggregate are greater than total ingot output.

However, with many restrictions placed by WPB on such essential civilian or less urgent war needs as the railroads, can makers, farm implement industry and certain necessary building, the demand upon some finishing mill units making such products as concrete bars, sheets, pipe, tin plate and wire is so light that these mills are operating at only a fraction of capacity. This throws the bulk of the ingot output to other products that are in greater demand such as plates, shapes, shell billets and special tubular goods. Since mills making the latter products are already at capacity, there may in a few months be a surplus of steel unless WPB relaxes some of its restriction orders. The surplus might be taken by heavier Lend-Lease shipments.

ANOTHER factor in the steel supply situation which will have a bearing on the growing scarcity of steel finishing equipment for war materials, is the steel recovery program calling for the great task of listing and diverting into use, idle and excessive steel inventories in the U. S. Some industrialists would like to see a loosening of restrictions on steel for some civilian products until all stocks of steel that will be reported to the Steel Recovery Corp. headquarters at Pittsburgh have been used up.

In conjunction with the Materials Branch and the Iron and Steel Branch of the WPB, the Steel Recovery Corp., has already received 100,000 preliminary reports from holders of steel inventories. Officials of the Recovery Corporation hope that all inventory questionnaires on stainless steel—this one has already gone out—steel ingots, billets, blooms and slabs, forgings, steel bars, sheet and strip, alloy steel, alloy castings and other items, will have been returned for correlation within the next three or four months. (The result will be a tremendous stock list for steel consumers. Sales will be consummated by direct contact betwen the consumer and the holder of the inventory. Warehouses will play an important part in getting the stored material into active use. The stock lists, which will go to warehouses, WPB regional offices, the Army, Navy and certain specified prime contractors, will be revised every ten days, with cleared items eliminated).

MEANWHILE the government is undertaking a thorough educational program on the workings of the new Controlled Materials Plan. Under this plan the government will decide what it wants from industry and when it wants it.

CMP may bring about a better distribution of materials. Having it in effect now, instead of in five to eight months would be an undeniable advantage to the United Nations—the equivalent of victory in a great battle. Before CMP there was no real planning of the military production program.

"Confession of failure of the Priorities System which WPB made at the (press) conference cannot but generate more confidence in the directing of the war," W. L. Moffett, THE IRON AGE *Washington Correspondent writes in a highly interesting article starting on page 74. Mr. Moffett notes that WPB and all of the government agencies connected with the war will have to be recognized to handle the new CMP plan; that taxpayers will benefit since plant expansions of all kinds have been projected with no one knowing how many were needed or how much material would be consumed.*

Whatever its weakness, the Priority System of material distribution will stay in effect for many months. War plants are now being warned by WPB experts not to alter their present method of handling priorities or to expect any immediate fundamental change in the Priority System. (This week many detailed changes were made. For latest priority revisions see page 129F).

For some plants the Controlled Materials Plan may not become effective until the third quarter of 1943. Priorities are expected to continue in effect beyond April 1, 1943, for some materials. So far, the only materials affected by CMP are steel, copper and aluminum. The most important steps that can be taken by industry in preparation for the coming of CMP are a study of its provisions (see chart on page 74) and still greater strictness in the handling of priority records. Under CMP extremely close records must be kept of material consumption.

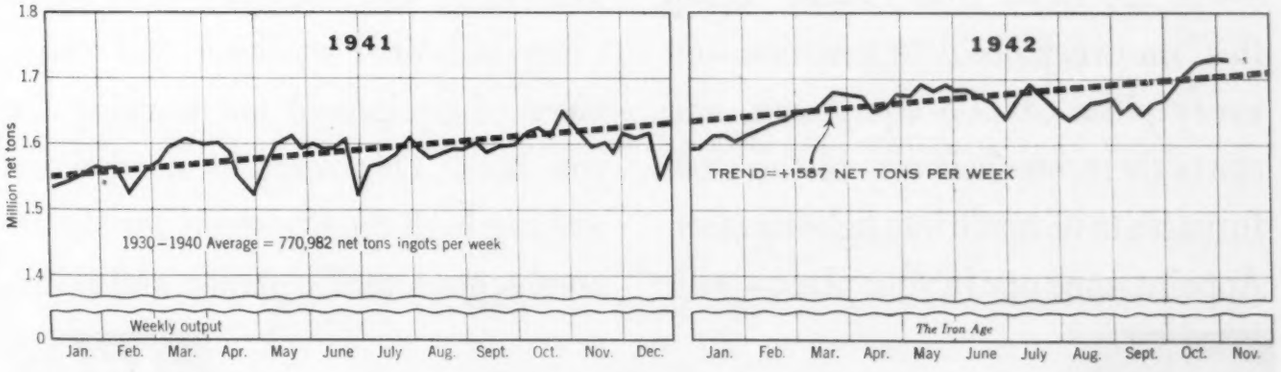
REACTION to CMP has not been entirely favorable. One criticism, originating in the automotive-aircraft industry, is that prime contractors will not be able, as asked under the plan, to obtain detailed materials requirements from all sub-contractors—many of them small—right down to the last ounce of each minor sub-assembly. Other obstacles to successful working of CMP are (a) shortage of qualified men for administration of the plan in WPB, (b) difficulties growing out of constantly changing specifications which necessitate reappraisal of quantities listed in the bills of materials, and (c) CMP's highly complicated nature.

Already there is speculation over whether there will be disputes between the Office of Civilian Supply and the Industry Branches when the Controlled Materials Plan goes into effect. According to CMP, the WPB Requirements Committee may earmark for specific purposes the banks of steel which it gives to the Office of Civilian Supply as a claimant agency. The Industry Branches which will have the duty of actually distributing material to prime consumers under the plan may oppose OCS determinations if earmarking of programs is not done by the Requirements Committee. (There is an ancient feud between the WPB Industry and Material Branches and OCS and this provision may fan it into flame. Not contributing to peace is the fact that OCS will have joint control with the branches over approximately 50 per cent of steel output.)

In line with WPB's determination that everyone shall understand the Controlled Materials Plan, a concise explanation is being prepared to take the form of "simple steps for little feet." The part each performer in the system is to play will be outlined in numbered steps.

STEEL plant operation this week sagged a half point to 99.5 per cent from 100 per cent last week because of repairs to furnaces. The only district where output jumped was Detroit with a 7.5 point gain to 109 per cent. Pittsburgh mill schedules dipped a half point to 100.5 per cent while Chicago dropped a point to 101.5 per cent. In Cleveland, operations fell four points to 98 per cent. Cincinnati output dropped 3.5 points to 95.5 per cent. Melting schedules in such centers as Youngstown, Philadelphia, Buffalo, Birmingham, St. Louis and the Eastern District remain unchanged from last week.

The Iron Age



Steel Ingot Production by Districts Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	S.Ohio River	West	St. Louis	East	Aggregate
November 5...	101.5	102.5	100.0	93.0	102.0	104.5	89.0	95.0	101.5	104.0	102.0	107.5	100.5	100.0
November 12...	100.5	101.5	100.0	93.0	98.0	104.5	89.0	95.0	109.0	95.5	102.0	107.5	100.5	99.5

THE HAND IN YOUR PLANT THAT STEEL WORKERS WANT TO SHAKE

— is the hand that chalks "scrap this" on every obsolete machine—on every piece of idle equipment, and starts them on their way to the steel furnaces to be made into fighting steel. Appoint some one in your plant—with knowledge and authority—to scrap every old-time machine and every piece of equipment not working for you *now.* This scrap is needed for making high quality steels for shells, bombs, guns, tanks, planes, and ships.

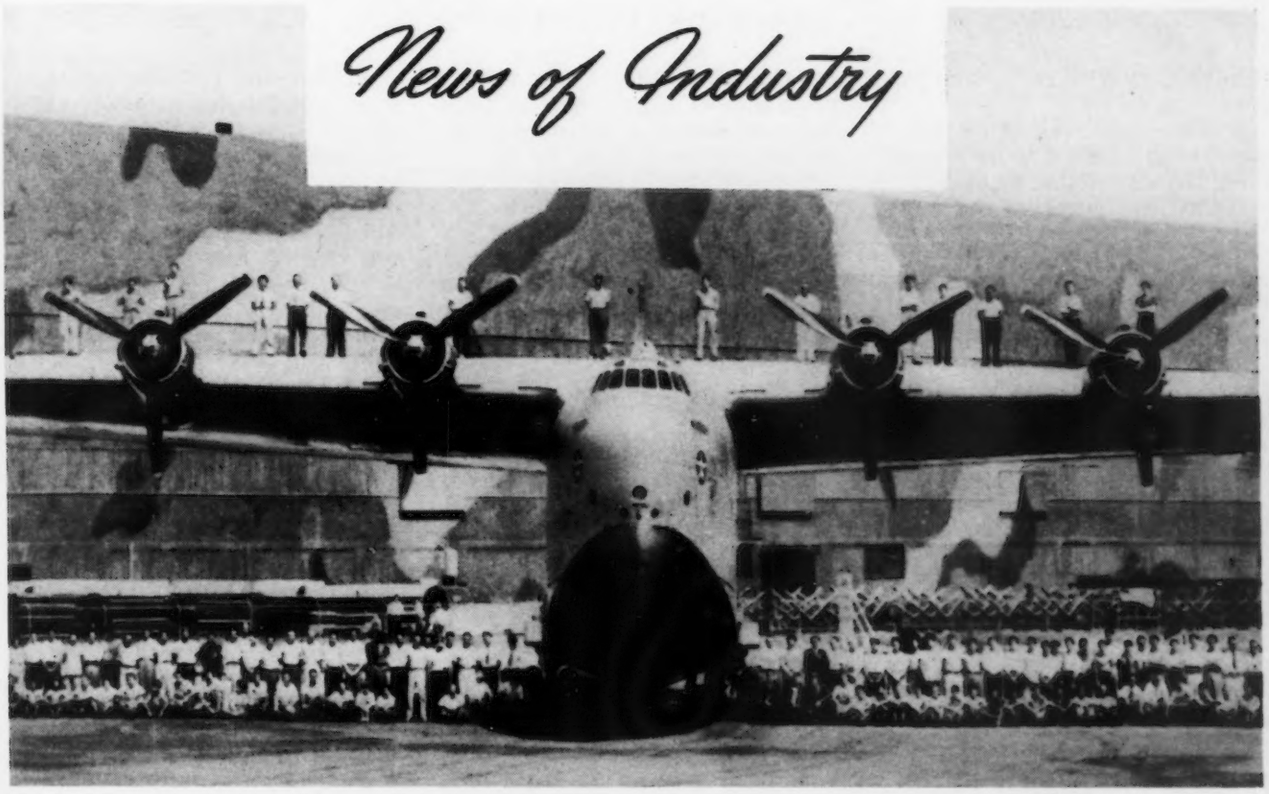
JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH, PENNSYLVANIA

PARTNER TO INDUSTRY IN WAR PRODUCTION

J&L STEEL

News of Industry



SUPER - CARGO CARRIER: This 70-ton flying boat Mars is the biggest cargo carrier of her kind in the world. Thirty-five men, spaced about six feet apart can stand across her wing-spread of 200 ft. Part of the experimental crew that built her stand in a double line beneath her wings. If this is what a 70-ton airship looks like, consider how Kaiser's contemplated 150-ton ship will appear. The photo shows only the center part of the plane and some of the workmen.

Steel Recovery Drive Gets Head Start, Stainless Is First

Pittsburgh

• • • **Uncle Sam will** soon know the description and tonnage of idle and excessive steel inventories throughout the United States. In one of the most gigantic jobs of its kind ever attempted in this country, the Steel Recovery Corp., in conjunction with the Materials Redistribution Branch and the Iron & Steel Branch of the War Production Board, will seek to locate, list, and attempt to dispose of steel inventories.

More than 200,000 preliminary reports have been sent to possible holders of steel stocks and last week more than 100,000 of these had been returned. The preliminary forms are the basis on which 16 separate and distinct steel recovery programs will be launched. Returns so far on the preliminary form which designates the amount and type of steel which is classified as idle or excessive inventory indicate that before long almost 400,000 specific inventories will be involved in this undertaking.

On the basis of information so far received, classification No. 1 or project No. 1 seeking information on stainless steels was launched last week. The stainless steel questionnaires were sent only to those whose preliminary reports indicated a stock of such steel. The other 15 programs will be in motion soon and will involve data on such items as steel ingots, billets, blooms and slabs, forgings, steel bars, wire, plates, sheets and strip, pipe and tubing, castings, alloy steel, alloy castings, tool steel, iron castings, wrought iron, and iron.

Steel Recovery Corp. officials expect that all questionnaires on the specific classifications will have been sent out and most of them received back within the next 90 days or so. The tremendous job of correlating and collecting the data in such shape that it can be used as a stock list for buyers seeking such material is so great, however, that some time may elapse before the inventories are properly labeled and available in sales booklet form.

Major points in the operating details of the stainless steel project and the other 15 separate steel recovery programs are as follows:

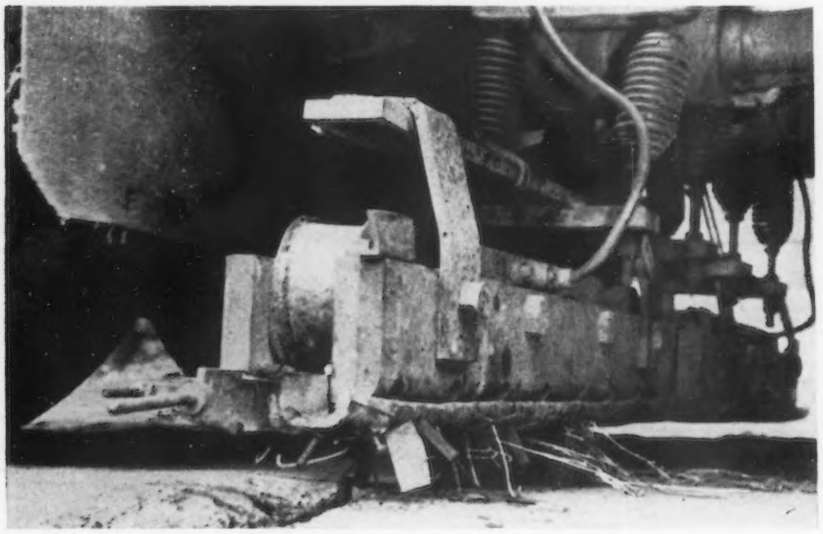
1. As quickly as inventory report forms are received back, the government will make every effort to locate qualified war users for the steel in its present form and thus move it wherever possible into immediate war production at market prices. It is emphasized that the government in this case attempts to find a buyer and the actual sale is a matter between the buyer and the holder of the material.

2. Holders of material are urged to seek their own qualified war buyers for their steel in its "as is" form and move it into war use at market prices as allowable under WPB priorities regulation No. 13 as revised. Where the sale is not regularly permitted by current WPB regulations, the holder can

then request WPB for special permission to sell.

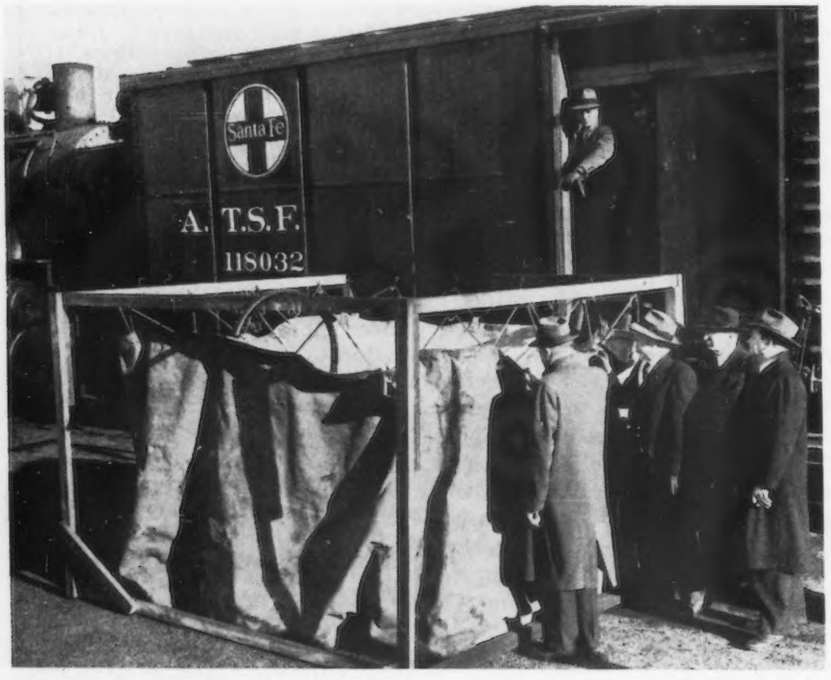
3. Where steel cannot be moved into war production in its present form, the SRC acting as agent for the MRC will purchase the materials and resell them as scrap. The price offered by the government for materials to be resold as scrap are above scrap prices.

More detailed mechanics of the plan which should be interesting to holders and possible buyers of steel, indicate that after the voluminous tabulations the inventories will be analyzed and interpreted by the Steel Recovery section of the iron and steel branch. Material which is in condition to be sold and used in the war program will be classified as such and published as a stock list sheet. This sheet will be revised each 10 days and copies sent to government agencies such as the Army, Navy, the warehouses, the WPB regional offices, and certain specified prime contractors. Provisions are made to eliminate from the stock lists all material which has been sold or cleared from inventories. In addition to the stock listing of items in booklet form, the steel recovery program has made provision for a group of experienced steel salesmen who will originate sales by telephone and other contacts. These two major devices for liquidating the nation's excess steel inventories will concentrate on their "as is" form.



Acme Photo

SCRAP CATCHER: Over 1600 pounds of nails, pins, paper clips and odd metal pieces were picked up in a 100-mile trip of this truck motivated magnet over the streets of Chicago. Operated by the Chicago Surface Lines on the routes taken by their buses, this magnet is credited with having saved many bus tires from puncture and an inestimable amount of transportation delay.



Wide World Photo

BOX CAR TANKER IDEA: Mark J. Fields of Chicago presents this idea for converting ordinary box cars into oil tankers. Four wooden bulkheads, such as the group is shown examining, with Faraprene (rubber-like) lined canvas tanks suspended, can be placed in a car. An intake valve at the top of the car and an outlet valve at the bottom is planned to permit easy filling and emptying. Each tank is planned to hold 2500 gallons which would give each box car a capacity of 10,000 gallons of oil.

In cases where steel inventories are not in such condition as to be sold in their "as is" form, they will be classified as scrap, and fair and reasonable scrap prices for such steel, according to Col. C. R. Baxter, chief, Materials Redistribution Branch, WPB, have been established by the government. In order to speed the voluntary movement of war production, prices set up by the government for material classified as scrap are above scrap prices.

The main theme of the Steel Recovery program is cooperation and requisitioning powers are not expected to be used unless absolutely necessary. Indicative that little or no trouble will be encountered by the SRC in redistributing the nation's inventories into war channels is the clamoring of hundreds of holders of inventory to immediately liquidate their stocks. Even before the complete machinery has been set going, help is being handed out to individuals or firms who wish to get rid of their idle and excessive inventories.

Idle and excessive inventories are described as follows:

Idle inventories:

(a) Stocks manufactured or acquired for sale in their present form by the present owner, but which are not being sold because

Steel Recovery Queries To Be Sent to Pittsburgh

• • • All questions, queries, forms, and letters concerning the steel recovery program should be addressed to the Steel Recovery Corp., 5835 Baum Blvd., Pittsburgh, Pa. Letters should not be sent to Washington since all files, information and experts involved in this program are located at Pittsburgh. Executives heading up the program include George L. Stewart, president, Steel Recovery Corp., C. H. Bradley, chief, Steel Recovery section, Iron & Steel branch of the WPB. Thorton E. Stokes, chief, Steel Recovery Program, Materials Redistribution branch, WPB.

the uses for which they were manufactured or acquired have been prohibited by existing orders and regulations of the War Production Board.

(b) Stocks manufactured or acquired for use in production by the present owner, but which are not being used because the uses for which they were manufactured or acquired have been prohibited by existing orders and regulations of the War Production Board.

Excessive inventories:

(a) All stocks of any item which are held for sale in their present form, and which are in excess of sales of that item during the 4 months preceding the owner's receipt of forms WPB 1100-A and 1100-B.

(b) Stocks which the owner is not holding for sale in their present form, and which are not required to be put into production within 90 days after the owner's receipt of forms WPB 1100-A and 1100-B to meet scheduled deliveries on orders *which are now on the owner's books* and which are permitted under existing orders and regulations of the War Production Board.

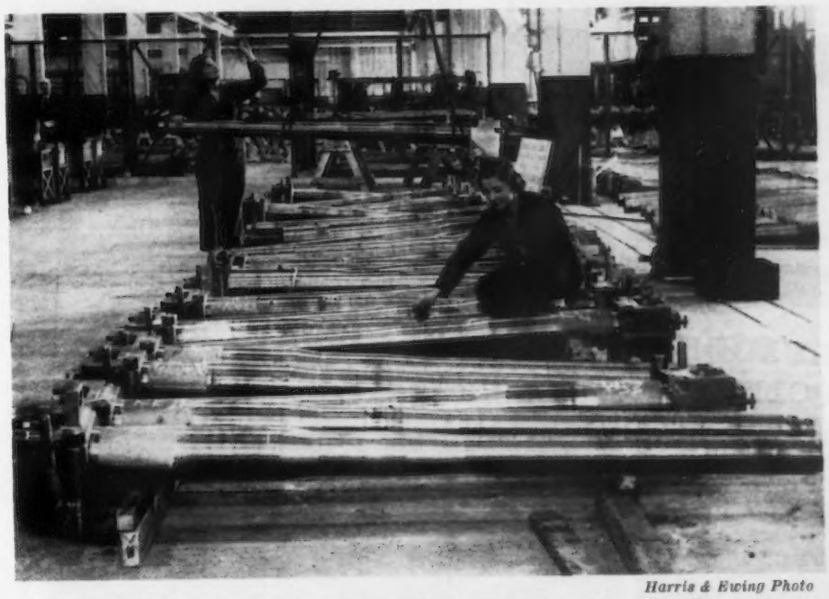
Idle and Excessive Inventories as defined above *do not include scrap.* By "scrap" is meant (1) obsolete, damaged, used, or imperfect material; and (2) trimmings, borings, clippings, rod ends, and all other remnants of material. Note that any attempt to dispose of *scrap materials* at more than OPA ceiling scrap prices may constitute a violation of the Emergency Price Control Act of 1942, Public Law 421 — 77th Congress. *Sell Your Scrap Through Scrap Channels.*

Mining Session in Utah Will Hear Hershey, McSherry

New York

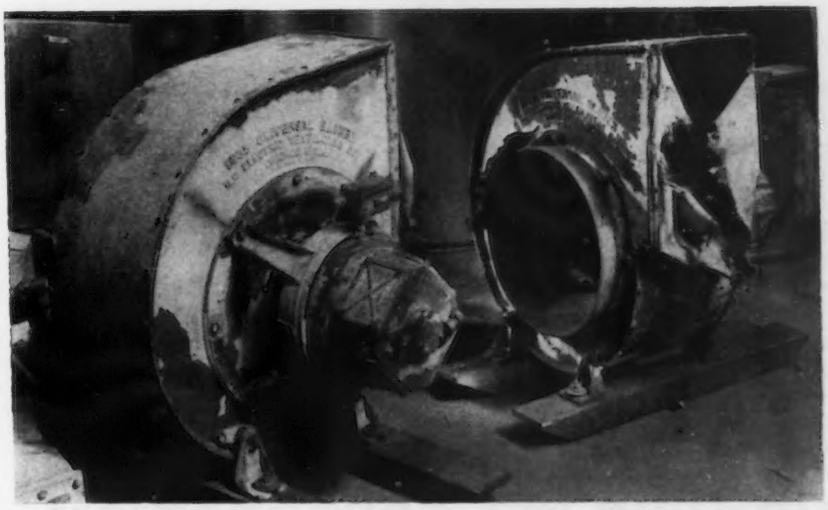
• • • Stimulation of production of critical metals for the war effort and means of overcoming increasing labor shortages in the metal mines will be the subject of a two-day war conference sponsored by the western division of the American Mining Congress at Salt Lake City, Utah, on Nov. 16 and 17.

Sessions of the conference will be highlighted by addresses by Major-General Lewis B. Hershey of the Selective Service System and Brigadier-General Frank J. McSherry, operations director of the War Manpower Commission. The conference will be opened by Mining Congress president, Howard I. Young, and the first session will be devoted to problems of metal production. WPB officials as well as leaders in metal producing fields will take part in the session.



Harris & Ewing Photo

NEW ANTI-TANK GUN: Here British women, who represent 80 per cent of the workers in this British Ordnance factory, are shown taking new 6-pounder anti-tank gun barrels to the finishing shop. This newly developed gun is said to easily pierce any armor encountered in German or Italian tanks and has the added advantages of good mobility and a high rate of fire.



RESCUED: These marine blowers which once saw service on a United Nation's tanker, were recently returned to their manufacturer, the ILG Electric Ventilating Co., Chicago, for testing. Although victims of a torpedoing which caused them to be submerged in the ocean for months, these blowers would still operate.

Ore Deliveries Down Slightly in October

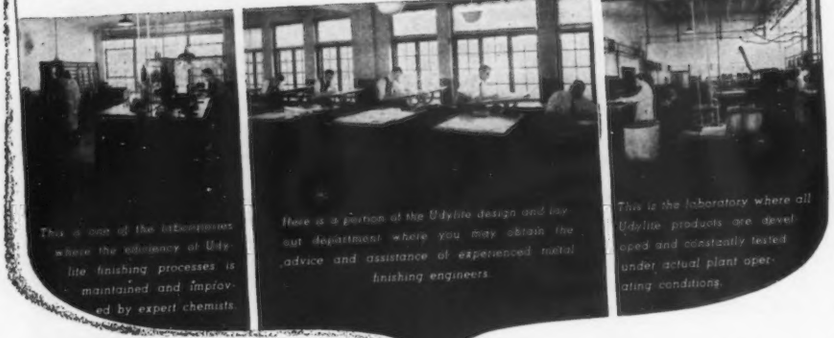
Cleveland

• • • **Iron ore shipments** from upper lake ports during October amounted to 11,417,167 gross tons, of which 11,377,289 gross tons were delivered to American down lake ports and 39,878 tons went to Canadian receiving ports. Shipments were down slightly from September's 11,847,919 tons, of which 11,780,446 tons were consigned to American ports.

Shipments during October to American ports brought the 1942 down lake ore movement to 83,430,205 gross tons, while total American and Canadian deliveries during the 10 months of this year are 83,858,620 tons. Shipments during the same period last year to American ports were 71,224,580 tons and to Canadian ports were 395,712 tons, or a total of 71,620,292 tons.

UDYLITE

HEADQUARTERS FOR ELECTROPLATING, POLISHING AND ANODIZING INFORMATION



This is one of the laboratories where the efficiency of Udylite finishing processes is maintained and improved by expert chemists.

There is a portion of the Udylite design and layout department where you may obtain the advice and assistance of experienced metal finishing engineers.

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For prompt, dependable metal finishing information, call on Udylite. No organization is better equipped to give you information gained from installing plating, polishing and anodizing departments in many leading manufacturing plants throughout the country. ● Trained plating engineers and electrochemists are at your service. These men *know* metal finishing and they can help you plan a new installation or revise your present one for greater efficiency. They know, also, that you want information quickly. ● Udylite has a complete line of equipment . . . second to none in terms of quality and efficient performance. ● and supplies . . . for every metal finishing need. Salts, acids, anodes, buffing and polishing materials—everything required. ● Call Udylite for prompt service on your finishing requirements. You pay no more for Udylite dependability.

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International News Photo

HUMAN MARS MAN: Looking very much like an imaginary figure from the planet Mars, this U. S. Army vehicle driver wears this strange looking mask as protection against dust. This photo was made of a driver operating in the desert region of Australia.

Byers Issues Charts and Texts on Wrought Iron

• • • **A unique industrial refresher course** designed to increase efficiency in the handling of wrought iron and thus save metal for war is being offered by the A. M. Byers Co. of Pittsburgh. The course, consisting of easy-to-read charts and instructive booklets, is designed for use by pipe fitters, plumbers, welders, and all other metal workers who work with wrought iron pipe or plates. It is also available for students in apprentice or up-grading training courses.

To date, four large wall-type instruction charts and four booklets have been made available. The charts cover the subjects of pipe threading, pipe bending, plate bending, and flame cutting and welding. The booklets cover the same subjects in much greater detail. Both charts and booklets present the subject in elementary form and simple language. According to officials of the company, hundreds of requests for each part of the instruction series have already come in and sets have been sent out for use by industrial maintenance crews, shipyard workers, plumbing contractors and many other groups. All reasonable requests are being filled as rapidly as possible.

Milestones

• • • **The Taylor-Wharton** Iron & Steel Co., High Bridge, N. J., in October celebrated its two-hundredth anniversary of iron making and fiftieth anniversary of manganese steel production. In all probability, the company is more than two hundred years old, but documents on record go back to 1742 and its history is known to be continuous since that time. Horse shoes, wagon nails, and crude farming implements formed the early output. By 1869, railroad products formed a large part of the production, and included car wheels, hammered and rolled car axles, car hooks and "all railroad forgings."

Before 1892 the company had been known as the Taylor Iron Works, but changed its name to the Taylor Iron & Steel Co. when it began the manufacture of manganese steel. The steel was at first used primarily for railroad tracks but later was used for power shovel teeth to help dig the Panama Canal, and then for many other industrial uses.

In 1912, the company was merged with the Wharton Co., Jenkintown, Pa., and new plants were opened in Easton and Philadelphia, and in 1913 it acquired the Tioga Steel & Iron Co., Philadelphia.

At present the company makes construction equipment parts, gas cylinders, shell forgings, tank treads, track and other products.

Metal Stitcher Redesigned By Bell Aircraft Engineer

Buffalo

• • • **Gerald A. Weingartner,** project engineer, Bell Aircraft Corp., has collaborated with a manufacturer in redesigning a sewing machine so it will apply 100 stitches in metal parts in the same time it takes to compress six to ten rivets or fabricate a part by spot-welding. Weingartner submitted his improvements and design to the Bell Patent Board which indicated a preference that it be made available to all other aircraft manufacturers. Gerry agreed. It is the second metal stitcher he has redesigned.

Welding Society Branch Opened at Flint, Mich.

Flint, Mich.

• • • **Organization of a Flint** branch of the Detroit Section of the American Welding Society is being completed following a meeting late in October. Elected chairman of the branch at this meeting was L. M. Skidmore of General Motors Tech. The vice chairman is Luther Ringer of Fisher Tank Division, and the secretary-treasurer is Edward Fisher, also of Fisher Tank Division.

The meeting, attended by 94 men, heard G. N. Sieger, secretary-treasurer of the Detroit Section of the AWS, speak on the "American Welding Society—Why You Should Belong." The balance of the gathering which followed a dinner, was devoted entirely to business matters.

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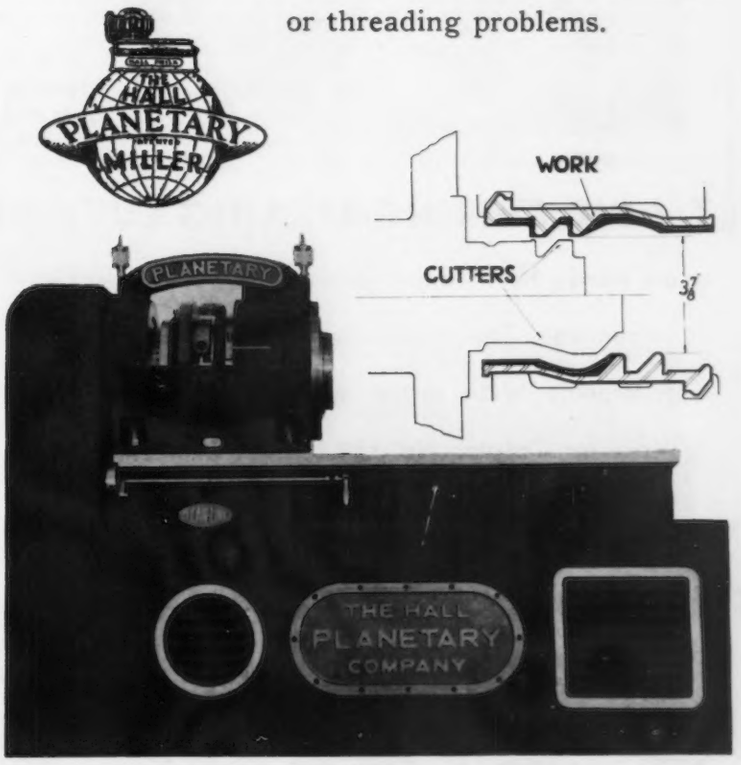
Internal form-milling or Planamilling is performed on this piece in two operations—reversing the work for the second operation.

Each Operation in 10 Minutes

Perfect location of shoulders. Concentricity maintained. Let us help you with your milling or threading problems.



HALL PLANETARY CO.

FOX & ABBOTSFORD AVE., PHILADELPHIA, PA.

Cited for Award

• • • **The thirteenth** group of Army suppliers to receive the Army-Navy "E" for outstanding performance on war work was announced last week by the War Department. The recently named companies include:

Acushnet Process Co., Rubber Division, New Bedford, Mass.

Armstrong Cork Co., Lancaster, Pa.

Bound Brook Oil-Less Bearing Co., Bound Brook, N. J.

Henry Disston and Sons, Inc., Philadelphia.

E. I. du Pont de Nemours and Co., Barksdale Plant, Barksdale, Wis.; Martinsville Plant, Martinsville, Va.; Seaford Plant, Seaford, Del.

Edgewood Chemical Warfare Arsenal, Edgewood, Md.

Emerson Electric Co., Booster Plant, St. Louis.

Eureka Vacuum Cleaner Co., Gas Mask division, Detroit.

Federal Products Corp., Providence.

Ferro Enamel Corp., Cleveland.

General Motors Corp., Plants A and D, New Departure division, Bristol and Meriden.

Heintz Manufacturing Co., Philadelphia.

Hilton-Davis Chemical Co., Cincinnati.

Huntsville Chemical Warfare Arsenal, Huntsville, Ala.

Ingersoll-Rand Co., Painted Post Plant, Painted Post, N. Y.

Irving Subway Grating Co., Inc., Long Island City, N. Y.

F. L. Jacobs Co., Main Plant, Detroit.

Jeffersonville Quartermaster Depot, Jeffersonville, Ind.

Lincoln Park Tool and Gage Co., Lincoln Park, Mich.

Mathews Cotton Mill, Greenwood, S. C.

M. B. Manufacturing Co., New Haven, Conn.

W. H. Nichols & Sons, Waltham, Mass.

Philadelphia Quartermaster Depot, Philadelphia.

Pioneer Parachute Co., Manchester, Conn.

Pittsburgh Forgings Co., Coraopolis, Pa.

Procter & Gamble Defense Corp., Wolf Creek Ordnance Plant, Milan, Tenn.

J. M. Service Corp., Kansas Ordnance Plant, Parsons, Kans.

Shoe Lace Co., Lawrence, Mass.

Standard Bleachery and Printing Co., Carlton Hill, N. J.

Transue and Williams Forging Corp., Alliance, Ohio.

United States Rubber Co., Des Moines Ordnance Plant, Des Moines, Iowa.

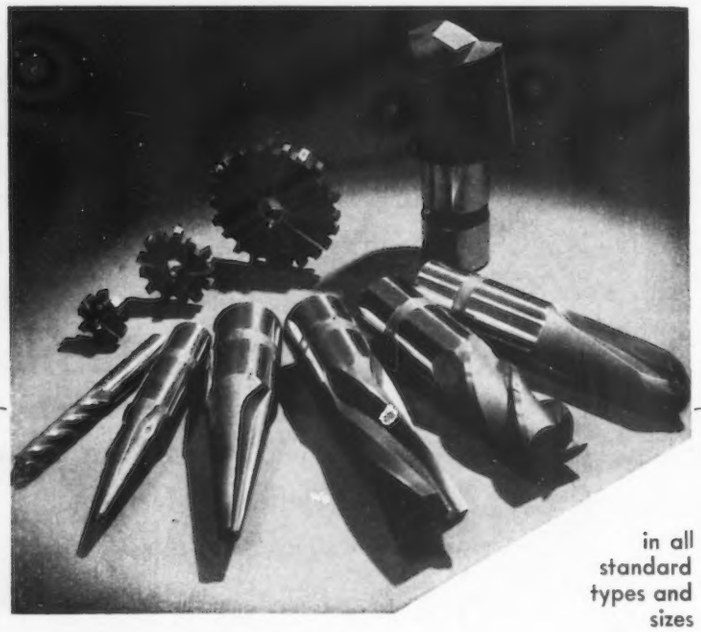
Uxbridge Worsted Co., Uxbridge, Mass.

J. H. Winn's Sons, Winchester, Mass.

Owatonna Tool Co., Owatonna, Minn.

Treasury Department "T"

Barnes - Gibson - Raymond division of Associated Spring Corp., Ann Arbor, Mich., and Detroit.



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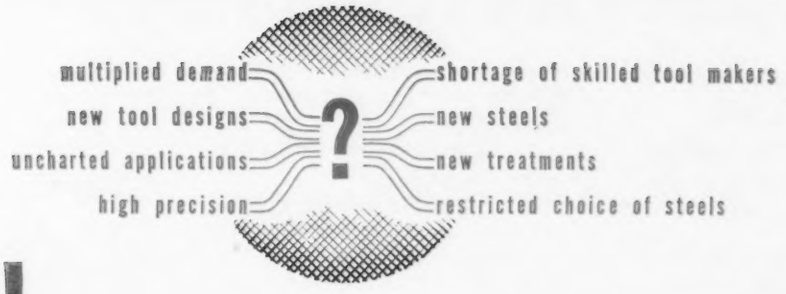
HYDRAULIC CYLINDERS



Aid on wartime tool steel problems

Top speed war production demands TOOLS — *more* tools than dreamed of in peace time — *new kinds* of tools for new war time jobs. The tool industry is tackling this tremendous task short of skilled tool makers and restricted by shortages in their choice of steels.

Solutions to these new problems are being worked out every day by the tool industry. Frankly, we don't have all the answers but our contacts with American tool makers determined to win this war puts us in a position to assist you in finding solutions to some of the particular problems that may be facing you.

On your problems of steel selection and treatment of tool steels, we would be very glad to have you get in touch with us. For your convenience, we are listing below the addresses of our district offices.

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COPPCO TOOL STEELS

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CHICAGO	122 S. Michigan Avenue	Harrison 1411
CLEVELAND	1158 Union Commerce Building	Cherry 1326
DETROIT	7-251 General Motors Building	Trinity 1-1760
NEW YORK	117 Liberty Street	Cortlandt 7-8314

Hot Topping Seen Bottleneck in War Steel Production

By T. C. CAMPBELL

Pittsburgh

• • • **War requirements which** are becoming more exacting as far as chemical and physical characteristics are concerned, are presenting the steel industry with greater production problems than have been faced for some time. Crux of the current problem which, if not solved soon, may retard production of steel, is the question of hot topping facilities.

Concurrent with the substantial increase of alloy steel production, which is now running more than 1,000,000 tons a month, is an increase in the difficulties in handling and processing ordinary carbon steels going into munitions and certain types of war items. Requirements for hot topping ordinary steel are expanding at a terrific rate and the same may be said for practically all alloy steel production.

Many firms months ago had realized that the hot topping of ingots to eliminate piping and thus increase the yield on specially prepared steels would require a substantial expansion in ingot mold supply, trackage in the melting shop, equipment in the stripping department, and more cubic space in the soaking pits. It was also realized that these special steels would require more specific handling in the blooming mill department, thus cutting down the total tonnage handled on a given turn. Most of these needs were included in proposed iron and steel expansion programs but to date many of these involving increase in hot topping equipment are somewhat behind schedule in completion due to lack of sufficiently high preference treatment.

As the war progresses, it will be found that alloy steels will be in

Farrel Type SR Gear Unit
used with Taber Spent Grains Pump

FARREL GEAR UNITS

DRIVE HEAVY DUTY SPENT GRAINS PUMPS

Farrel gear units are especially developed for applications where dependability and sustained operation under severe conditions are basic considerations.

Typical of such applications is the single reduction unit illustrated above, as applied to the Taber Pump Company's spent grains pump for the brewing industry. This pump is a heavy duty unit especially constructed to meet the rigorous requirements in that industry. The features of the Farrel gear units are admirably suited to conditions of that type.

Gear cases are proportioned to the repeated peak loads of heavy duty operations; joints are sealed to withstand atmospheric conditions of moisture, dust and grit; shafts and bearings are factored to safeguard against interruption of critical processes; gears are precision-generated for smooth, quiet operation and long life.

Farrel gear units have the advantages of general standards in principal features and the flexibility for adaptation to specific conditions of load, speed and service.

Catalog No. 438, containing complete descriptive and engineering data will be sent on request.

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FARREL-BIRMINGHAM COMPANY, INC.
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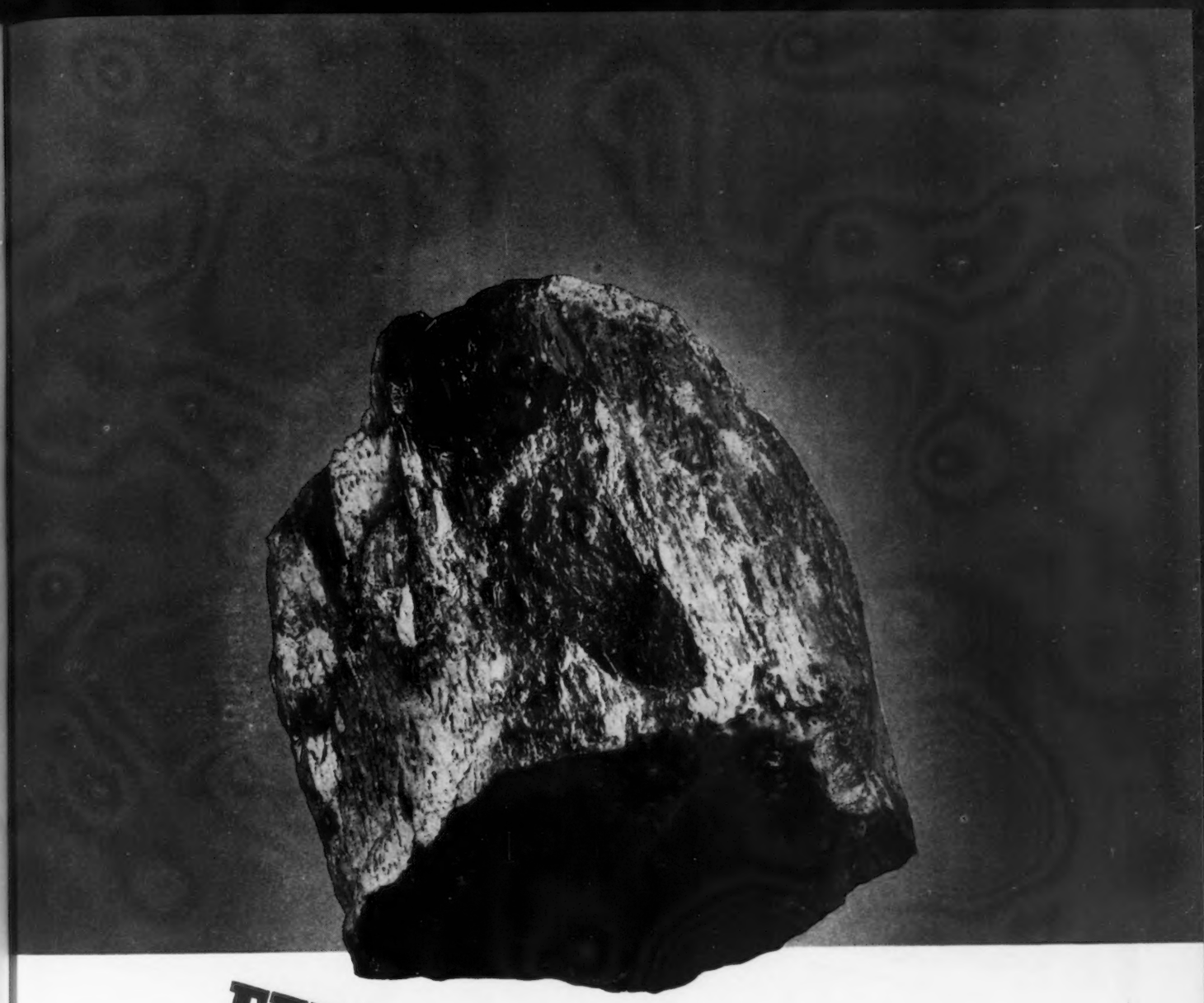
The Gear with FARREL *a Backbone*

TANK WOMEN: Every tank that is destined for delivery to the battle-front from England is completely checked by at least four of these A.T.S. storewomen. Their job is to thoroughly grease the mechanism and batten down loose parts. Here one of them greases the tank tread while others attend to other parts.

British-Combine Photo



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. . . Refined from Silica, and supplied to the Steel Industry in all grades,* but with only *one* grade of service . . . the best we can give, always!

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much greater demand and ordinary carbon steels will require greater processing. The experience of the steel industry in the past several weeks wherein steel ingot output has been slightly above 100 per cent of rated capacity is in reality a greater achievement than the figures would indicate. This is true because in recent months the melting time for many steels has been lengthened considerably.

Surveys indicate that many special steels for war armaments, whether they be carbon or alloy, require considerably more time in melting and handling than ordinary peace time requirements. The trend in this direction is very definite and unless the proper provision is made immediately for increased hot topping facilities, the country may soon run into a bottleneck in the production of urgently needed and high quality steels.

The steel industry has not been asleep at the switch in anticipating these requirements but has done all in its power to expedite the construction of projects which would give more molds, more trackage, and more soaking pit space to take care of these war needs. As in pig iron expansion as well as electric steel plant construction, the same bottleneck has appeared, namely, inability to obtain the necessary raw materials for these expansions due to Army, Navy, Maritime and Lend-Lease requirements knocking out or retarding orders which would have taken care of the situation.

The hot topping situation and the increase in exact chemical and physical steel requirements not only applies to the United States war needs but to practically all lend-lease orders. It is believed that WPB is now fully cognizant of the seriousness of this situation and may soon move to break the jam which so far has prevented the steel industry from *producing to its fullest capacity* those special carbon and alloy steels which must have hot topping treatment.

Alaska Miners Turn to Construction Projects

• • • The majority of the 30,000 workers in Alaska's gold mines, which have been ordered closed by WPB, are going into construction work, rather than into copper, lead or zinc mines, according to a *New York Herald Tribune* report from Ketchikan, Alaska. Those workers who come to the United States will be barred from any employment except in the strategic metal mines, but most will remain to work on airfields, spur roads and other construction projects in Alaska.

Few of the miners have worked in anything but above-ground placer operations. Only one underground mine, the Alaska-Juneau, employs large numbers of hard-rock miners, and this mine is continuing work because it produces lead as well as gold.

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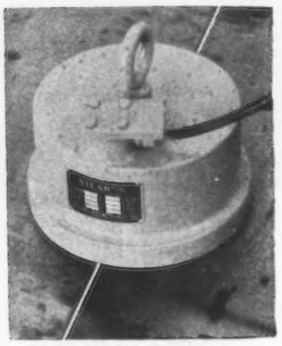
MAGNETIC for EQUIPMENT to SPEED Production Consult Stearns MAGNETIC



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STEARNS Holding Magnet or Magnetic Clamp holds plates in alignment for lap welding quickly, safely, economically, a difficult job made easy. Feel free to consult us on fabricating problems. We may be able to help you get smoother, faster production.

Stearns Hand Magnet

The STEARNS Hand Magnet has many applications in laboratories, engineering departments, offices, for small capacity separation problems. Inexpensive in initial and maintenance cost.

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We are now preparing for the increased demand of 1943 so that there won't be any shortage of Chromang armor welding electrodes.

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WICHITA, KANSAS	*Watkins, Inc.*

Manpower Resolves in Tangle WLB Policy Criticized

• • • **The manpower situation** this week was characterized by criticisms, haggling, reports on women's unwillingness to cooperate and predictions. In addition a WLB panel passed down an opinion which has all the earmarks of a general order to the steel industry to pay the same rate and take the same medicine as has been the fate of "big" and "little" steel.

The opinion which was rendered against Jones & Laughlin Steel Corporation, last of the big producers to get the blow, recommended a 5½c. general wage increase, retroactive to Feb. 15 as happened in the case of both U. S. Steel and the "little steel" group.

The employer member of the panel dissenting from this phase of the opinion stated that the retroactive payment should not extend beyond Aug. 9, the date on which the contract should have expired as a result of the union's notice of desire to negotiate.

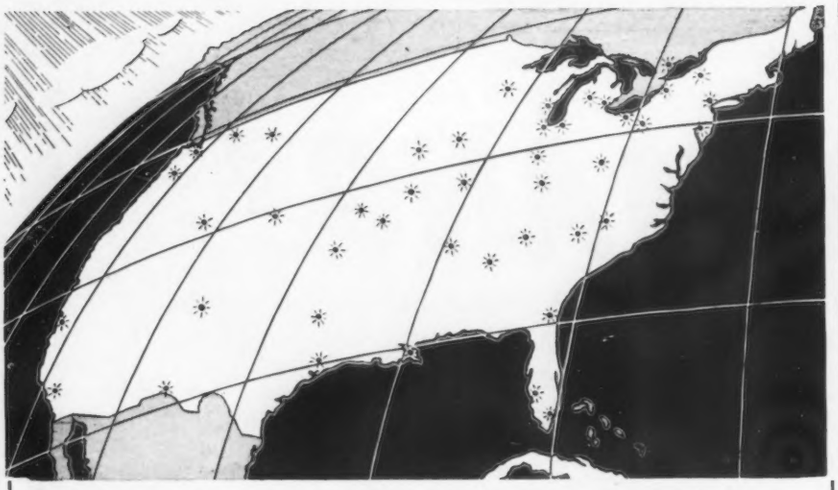
In the same decision, J&L was refused the right to use a $1 per day fine to prevent strikes. The opinion rendered in opposition to this suggestion for controlling strikes pointed to the standard clause in all union contracts which permits the employer to fire a worker after five days of suspension if the worker refuses to return to the normal course of operations. It was also said, that such powers granted to a company, vested entire authority for judgment of the necessity of such action as fining a striker in the hands of the employer without means of recourse.

This method, however, is reported to have worked satisfactorily in the J&L captive mines without complaint of company misuse of power. It is also well established that J&L had no other thought in mind than to find a "bluff" method of restraining strikers through wage loss to them, as the "firing" clause in the union contracts has been found to have many loopholes.

Biggest loophole is the fact that today's strikes do not last, as a rule, longer than one or two days and the worker, even though suspended immediately after the strike is called, can very readily return to a plant that is working again before his five days of suspension have expired—the requirement necessary to his discharge. Thus, the clause although seeming to be restraining is easily avoided and doesn't function to stamp out the one and two day strikes which have been the bane of the steel industries existence.

It will also be noted in the Jones & Laughlin third quarter report and in the reports of many other steel companies that provisions have been been made this quarter for payment of back wages as a

Strategic Heating Points



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LOS ANGELES, CALIF. — H. F. Haldeman, Inc.
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result of anticipated WLB decisions granting retroactive pay to Feb. 15. It is plain to be seen in this fact, that practically every firm in the steel business has recognized the inevitable—all are going to face a general order to meet the terms of the U. S. Steel Corp.'s wage directive.

Most prominent of the predictions made this week, originated in an *American Magazine* article by Harry L. Hopkins, special assistant to the President (and believed to be speaking for the President). The prediction stated that a huge shift of labor from civilian industries to war production work was just in the offing according to new government planning.

The plan was referred to as a manpower-distribution plan but no details were given as to how results were to be obtained except an allusion to allocation of manpower. Even though the President has temporarily shelved talk of a compulsory manpower-control bill on the grounds that the labor unions desire to study the needs for such legislation, it is evident that he is of the opinion that the public is not yet ready for such action and is only suppressing his designs until such time as opinion has been fed to the point of submission.

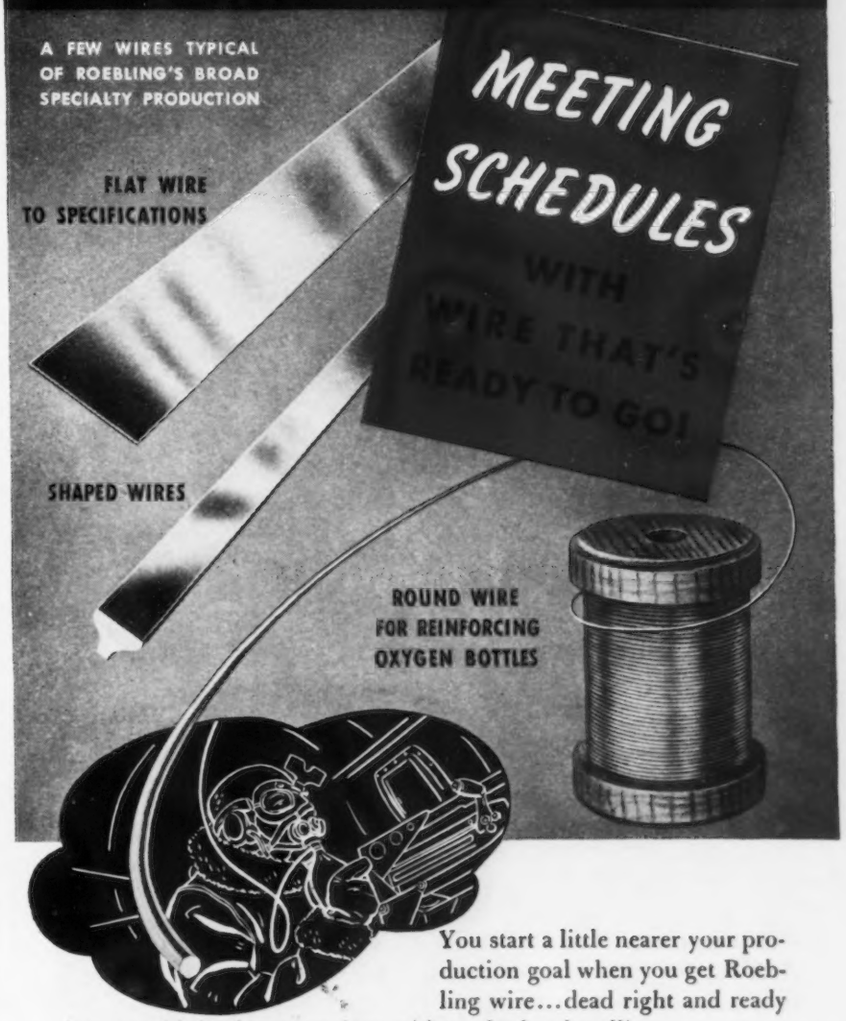
Gist of the plot was that some 7-million out of a potential 9-million now engaged in civilian-supply industries would be converted to war work and that high school courses and possibly school hours would be altered to permit the youngsters to work for war. In addition to conversion of workers, Mr. Hopkins forsaw the employment in war work of some 6-million persons now idle which included women, older persons and boys and girls of school age.

A warning appearing this week, came from representatives of a number of labor unions appearing before a Senate Labor and Education subcommittee who said that the manpower situation was in a critical state because some cities had large pools of idle, skilled labor while war production plants had idle machinery for lack of skilled help.

John Green, president of the CIO marine shipbuilders union, said in effect that the Labor-Management Policy Committee of WMC had failed to deal with the problem as a whole and that his

ROEBLING *Wires*

ROUND . . . FLAT . . . SHAPED


A FEW WIRES TYPICAL OF ROEBLING'S BROAD SPECIALTY PRODUCTION
FLAT WIRE TO SPECIFICATIONS
SHAPED WIRES
MEETING SCHEDULES WITH WIRE THAT'S READY TO GO!
ROUND WIRE FOR REINFORCING OXYGEN BOTTLES

You start a little nearer your production goal when you get Roebling wire...dead right and ready for your fabricating operations without further handling.

This round wire that reinforces an airman's oxygen bottle is typical of the tough wire-for-Victory assignments that Roebling is handling today. To withstand stratosphere temperature and pressure changes, steel analysis and temper must be held within close limits. For top speed production on the winding machines, ductility and dimensions must be "on the nose". And because these specifications are being met, wire rolling out of the Roebling mills today will be flying next month.

Make sure your production men know the facilities available at Roebling for production of special round, flat and shaped wires. We have built a reputation solving tough problems and have the manpower and facilities to solve yours. Prompt action on war orders.

JOHN A. ROEBLING'S SONS COMPANY

TRENTON, NEW JERSEY Branches and Warehouses in Principal Cities

experience on the committee convinced him that it was "obviously solving nothing because our partial approach to the problem merely paved the way to the next eruption and did nothing to get at the central point of infection." Actual solution to the problem, many believe, lies in the appointment of a true overall coordinator armed with authority and dedicated to the proposition of concentrating all government agencies interested in the subject under one power, plus some necessary changes in the policy of draft boards on exemptions and the Army and Navy on free recruitment.

Another reorganization of the industry branches of WPB was forecast this week with decentralization of power from the Office of Director General for Operations to each industry branch giving them full responsibility for all phases of operations in their specific industries including labor. With this additional responsibility, each industry branch was to have the appointment of a representative of labor, thus apparently shoving the responsibility for labor's actions within the industry onto the shoulders of labor's own representative. First appointments of this kind are expected to be in the steel, sulphite and paper, printing and publishing branches.

In the midst of the manpower turmoil, the President is reported to be studying a report and recommendations of the WMC Labor-Management Policy Committee which they prepared in rebuke of Paul V. McNutt's constant demands for some type of national labor-controlling legislation (apparently not to the committee's liking).

Director of WMC, McNutt, whose position has become increasingly uncertain as confusion grows around the manpower situation, has read the committee's report and stated at a recent press conference that its contents were satisfactory to him.

The effect the recommendations,

International News Photo

MOB SCENE?—Looking something like a mob scene in this view, only because it is the opening of a new airplane parts plant, Mrs. Tennill is shown operating the same machine her husband formerly worked before going into the Army. Mrs. Tennill pressed the button which officially opened the new parts plant of the Tyson Bearing Corp. in Massillon, Ohio.

Boiler rooms — responding to Industry's call for more and more power — frequently suffer atmospheric temperatures that exceed human endurance. But these days, power cannot fail—and Buffalo engineering is helping to assure that it won't!

The Buffalo Special Disc Fan shown to the right is designed to swiftly expel torrid air, thereby facilitating the supply of fresh cool air for the men who man the boilers. Ruggedly built to handle large-volume air supply without shut-down, these Buffalo Fans operate smoothly, efficiently.

Here, as in so many important ways, Buffalo is contributing to Industry's war program.

Buffalo
FANS and AIR CONDITIONING EQUIPMENT

BUFFALO FORGE COMPANY

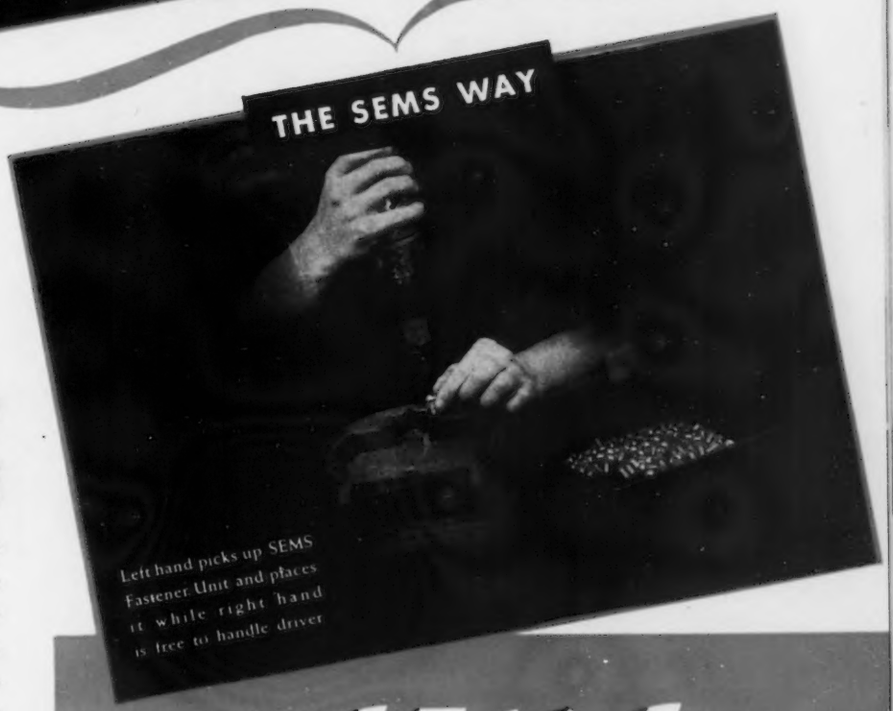
492 BROADWAY BUFFALO, NEW YORK

Branch Engineering Offices in Principal Cities

CANADIAN BLOWER & FORGE CO., LTD., KITCHENER, ONT.

THIS ELIMINATES THIS!

THE OLD WAY
Right hand reaching for lock washer and left hand for screw and bringing them together to assemble
Placing assembled unit in position with left hand and bringing driver towards work with right



Candid Proof

OF IMPORTANT TIME SAVINGS!

The camera tells you how SEMS Fastener Units save vital production time. No wasted motions—no chance to "forget" the lock washer! A perfect fastening for "green" workers. With only one unit to handle, it speeds driving! Inventories always balance and one order covers both parts. Take advantage of this pre-assembled unit—let your workers try it! Handy kits of assorted testing samples are ready—write for yours now!

SHAKEPROOF inc.

"FASTENING HEADQUARTERS"

2501 North Keeler Avenue, Chicago, Illinois

Distributor of Shakeproof Products Manufactured by
ILLINOIS TOOL WORKS

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SEMS FASTENER UNITS • THREAD-CUTTING SCREWS • LOCK WASHERS • COWL FASTENERS • LOCKING AND PLAIN TERMINALS • LOCKING SCREWS • RADIO AND INSTRUMENT GEARS • SPECIAL STAMPINGS

SEMS

REG. U. S. PAT. OFF.

FASTENER UNITS

PRE-ASSEMBLED SHAKEPROOF LOCK WASHER AND SCREW

if carried through, are expected to have on the typical American worker are that he will be forbidden to enlist voluntarily in the armed forces after Jan. 1; the WMC is expected to be given authority to classify every person for type of war effort most suitable to the individual's talents; jobs will be granted only in war industries on a job permit or priority basis; and the United States Employment Service may become the universal hiring agency for all war plants.

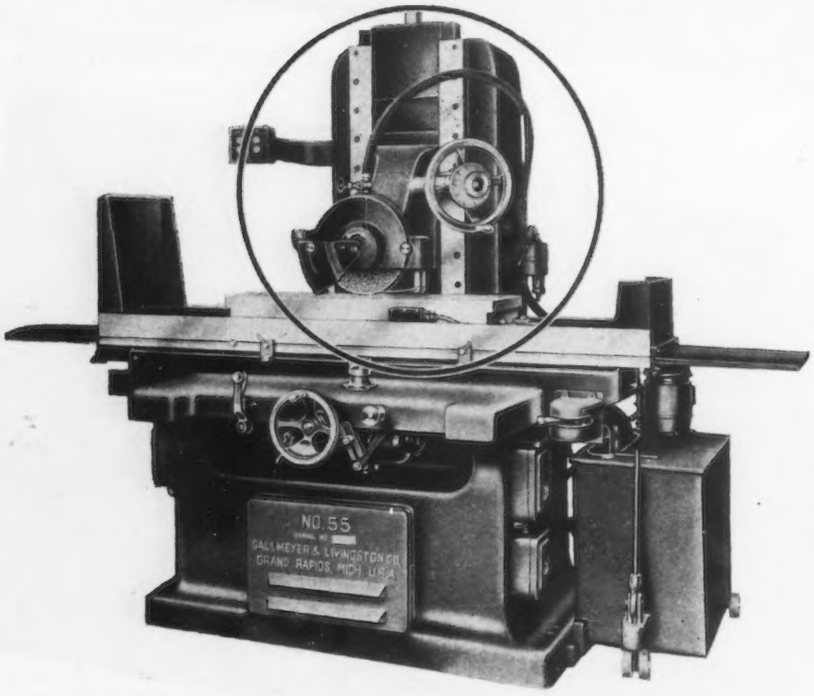
Although U. S. Steel and its subsidiaries and practically every company receiving the WLB "little steel" decision since has dissented strongly from certain aspects of their decision, Montgomery Ward & Co. seemed to be the first to outright defy the board and suggest a finish fight on a decision. Few will say that this isn't desirable in our Democracy but even fewer have shown the courage (or indiscretion) to buck the government on such a matter. The controversy hinges on MontyWard's acceptance of the union security clause (closed shop) which they stoutly refuse on the grounds that they believe it illegal and it would cause them to surrender a policy which they consider fundamental. Looking back to the statements of U. S. Steel, it can plainly be seen that they, too, questioned the legality of recent WLB policy to the extent of going on written record of dissension for apparent purposes of re-arousing the subject at some more settled time.

Baltimore women have proved a great disappointment to the WMC and the USES as means of solving the manpower situation, according to recent statements of the USES. Baltimore, chosen some time ago as an ideal test spot for operations of WMC manpower-solving ideas, was recently set up to refer 1500 women per week to war plants in the vicinity in an effort to fill the request of Baltimore vicinity plants for 13,000 workers by December.

Discouraging results have been shown both in the willingness of women to apply for such work and in their ability to learn and operate the jobs for which they applied. In the first four weeks of operation the recruiting centers

GRAND RAPIDS

Precision Grinders



THIS hydraulic feed surface grinder combines rigidity with extreme accuracy. Patented vernier control graduated in .0001". Split tenths even on production job. Table Speed to 125ft/min. Table movement 13½x38". Table Size 12x36".

Catalog GL-100 on request.

GALLMEYER & LIVINGSTON CO.
200 STRAIGHT AVE., S.W.
GRAND RAPIDS MICHIGAN

WOMAN EXPERT: Generally it is the man who teaches the women about such things as machine operation but in this New England plant of the General Electric Co., Sarah Trotsky, veteran of 30 years factory experience, has turned the tables. Shown breaking-in Franklin R. Madison, 18-year-old high school graduate, Sarah, who operates lathes, drills and other machines with equal ease, is preparing Franklin to take over the second shift.

International News Photo

McKAY

from TIN PLATE *to* ARMOR PLATE

Light armor plates for tanks require special heavy duty roller levellers, such as the one illustrated above.

McKay Levellers are specially designed for leveling the various widths and thicknesses of all kinds of plate.

GIVE US YOUR REQUIREMENTS and WE WILL SUBMIT SPECIFICATIONS FOR THE SIZE AND TYPE OF LEVELLER YOU NEED.

The **McKAY MACHINE** *Company*

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

ASSOCIATED COMPANY

The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

MURCHEY TYPE "G"
(NON-ROTATING)
SELF-OPENING DIE HEAD

DIES &

Whatever your production schedules may be, Murchey has a complete line of self-opening dies and collapsible taps to give you good threads on a production basis. Murchey-cut threads pass inspection!

TAPS

MURCHEY TYPE "M"
COLLAPSIBLE MACHINE TAP

MURCHEY MACHINE & TOOL CO., DETROIT, MICH.

(whose quota was then 1000 per week) could only get 1441 women to apply. The last three weeks' average of 811 per week has resulted in only 345 per week being suitable to send to training centers, on an average. Many who went on jobs were reported to have worked less than a week when they would quit discouraged over inability to learn masculine tasks readily or found in a period of two to four weeks that long hours of standing were too tiring. The experiment, while not given up, reflects a discouragement which suggests that the quotas and expectations were set too high to begin with.

•

WLB Sets Policy For Wage Control

Washington

• • • **Following on the heels** of an anonymous statement from a Washington official that the WLB had not been able to arrive at a wage control policy, the board decided unanimously this week that its wage control yardstick would be the "little steel" principle. This principle entitles wage earners to an increase of 15 per cent to cover the rise in the cost of living between Jan. 1, 1941, and May 1, 1942.

The policy adopted accepted the wage level of Sept. 15 as equitable and agreed that no increases above that amount would be permitted except in accordance with the new wage control directive. The rise in the cost of living between May 1, 1942, and Sept. 15, 1942, will be ignored in dealing with wages.

The ten regional directors of the WLB, who will receive wage adjustment applications from Wage and Hour offices, will be given authority to pass on all cut and dried applications which plainly come within the scope of the "little steel" principle, so long as the applications come from a certain group of industries listed by the WLB in their policy directive. Applications from other industries, not on the list, will be referred to the board. This list arrangement was made so the board could keep the authority over widespread industries whose ranks might be split by local decisions of individual regional directors.

The board did not adopt a policy for dealing with substandard

wages as it felt that too few cases of this kind had been recorded to serve as a basis for opinion. The 15 per cent basis is expected to be the maximum point for general wage increases, however, individual increases for promotions and for other normal reasons will not be in any way retarded.

•

WLB Panel Opposes J&L Plan to Fine Strikers

Pittsburgh

• • • **Jones & Laughlin Steel Corp.** was informed this week by a panel of the War Labor Board, considering its new union contract requirements, that a majority vote of the panel had recommended omitting the clause which would permit the company to fine strikers $1 a day for striking and included the requirement that the new contract contain the equivalent of the wage terms and security provisions met by the U. S. Steel Corp. and subsidiaries.

This ruling automatically recommends a pay increase of 5½c. an hour and involves retroactive payment of this increase to Feb. 15, the same as was required of both the U. S. Steel Corp. and the little steel group.

James Tanham, the employer member of the panel, dissented from the opinion on wages stating that the retroactive feature should not go back farther than Aug. 9, the date on which the present contract expired as a result of union notice of desire to negotiate. This same dissension was shown in the U. S. Steel case but was disregarded by the board in making final decision.

In answering questions regard-

COMING EVENTS

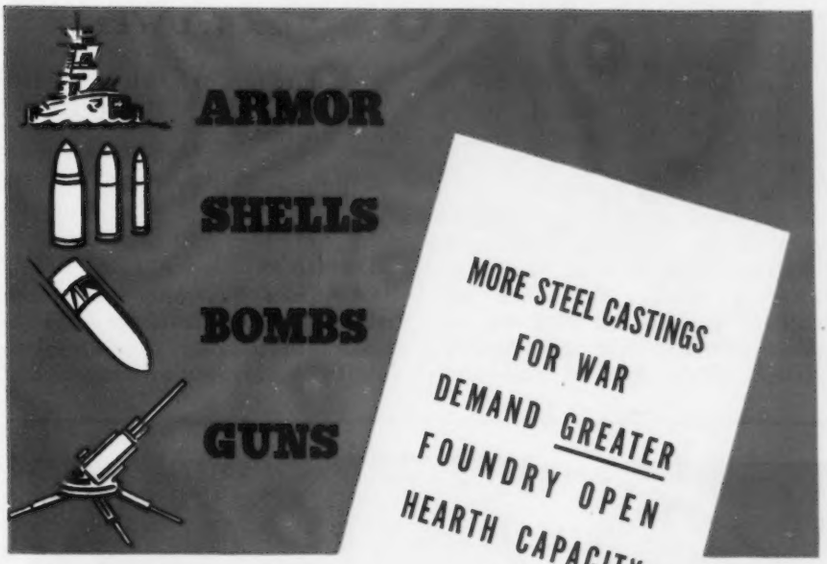
Nov. 24 to 29—National Chemical Exposition, Chicago.

Nov. 30 to Dec. 3—American Society of Mechanical Engineers, annual meeting, Hotel Astor, New York.

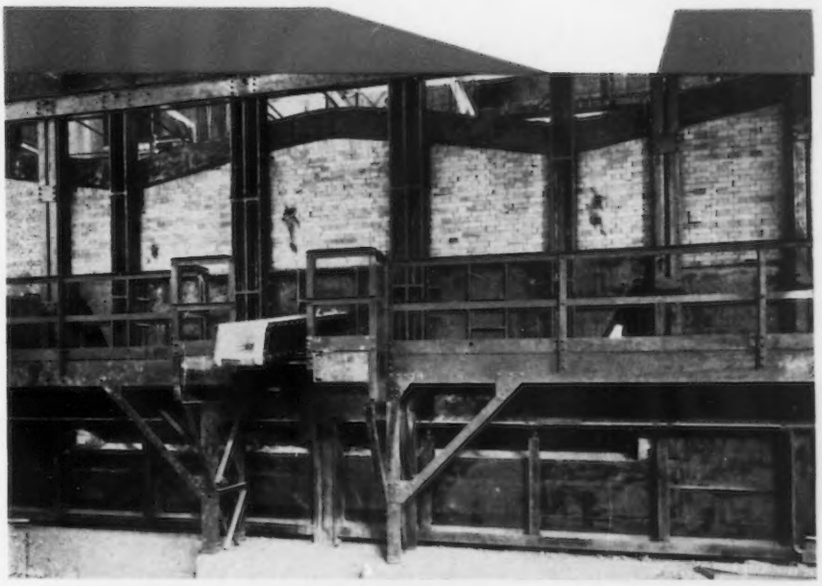
Nov. 30 to Dec. 4—National Exposition of Power and Mechanical Engineering, New York.

Dec. 1 and 2—American Society of Refrigerating Engineers, New York.

April 7 to 10, 1943—Electrochemical Society, Pittsburgh.



★★★★★★ ★★★



Swindell 40-ton Open Hearth Furnace—one of many serving the metallurgical industry.

SWINDELL

builds to this year's requirements of MORE TONS PER HEAT . . . through forward design and construction. Send in your inquiries for additional data *now!*

SWINDELL-DRESSLER Corporation
DESIGNERS AND BUILDERS OF MODERN INDUSTRIAL FURNACES SINCE 1896
PITTSBURGH, PA.

ing the use of a $1 a day fine on strikers, Martin Rappel, public member of the panel, cited a clause present in all union contracts providing for discharge of an employee after 5 days' suspension if the employee refuses to continue normal work operations after a strike. Grievance machinery is also provided for appeals of such cases to final decision. This detailed and slow procedure is what J&L is believed trying to avoid by the suggested fine method.

•

Cuban Skilled Help Offered to U. S.

Washington

• • • **Cuba has offered** to send skilled workers from the island to assist in solving the American skilled manpower shortage. The offer was made through Juan Arevalo, secretary of the Confederation of Cuban Workers. Senor Arevalo is said to have stated that the offer was under consideration here and that probably 10,000 skilled workers could be supplied. These would include metal workers, mechanics, port workers, miners and some sailors for merchant marine service.

The plan of entry, said to have been discussed here, is that the workers be admitted as an emergency measure with the American government holding 10 per cent of the worker's wages for delivery to the worker on return to Cuba. It was hoped that the American unions would admit workers to their membership for the duration.

•

Brotherhood Official Joins Labor Committee

• • • **Carl J. Goff,** assistant president of the Brotherhood of Locomotive Firemen and Enginemen was appointed as vice-chairman of the newly formed WPB Labor Requirements Committee which is headed by Ferdinand Eberstadt, vice chairman of WPB.

Thus, organized labor has won another representation on a major government committee, this time in a capacity of advising the War Manpower Commission as to the relative importance of various types of labor in war production centers.

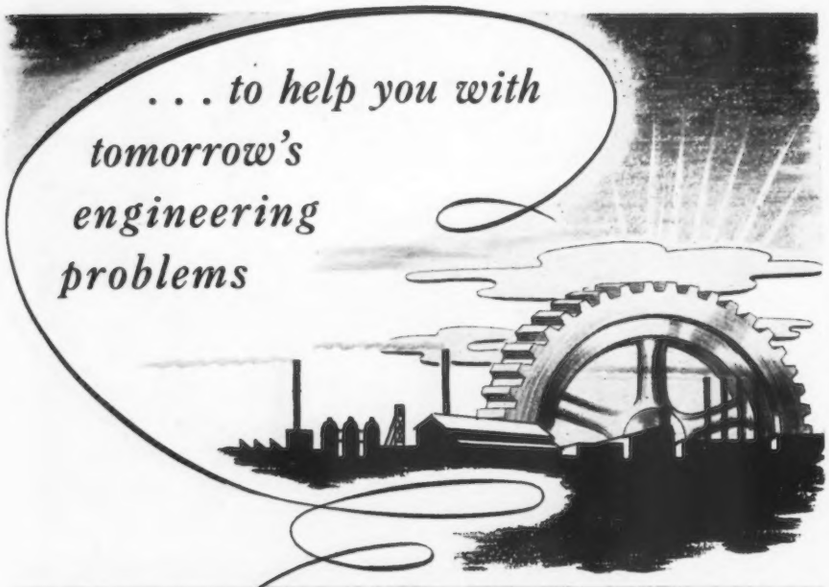
The general scope of the committee's duties will be to advise WMC on the affect of changes in the war supply program as it relates to labor requirements; make recommendations on the relative importance of less essential industries as a basis for transfering workers; advise on the feasibility of new production programs from the standpoint of manpower; and create labor requirement programs for war production areas.

•

Independent Union Seeks Wright Aero Bargaining Rights

Paterson, N. J.

• • • **Repercussions from** the recent NWLB order directing the Wright Aeronautical Employees Association, an independent union, to disassociate were seen here this week in a meeting of representatives from some 42 independent unions of Northern



YESTERDAY American industry dropped what it was doing to take on an entirely new responsibility—the gigantic task of making tools of war—in most cases, an unfamiliar type of production.

Today we see the tangible evidence of America's typical ingenuity and spirit. We are glad to be sharing in this responsibility. Our large staff of over 500 qualified engineers is busy helping industry convert its equipment and facilities from peacetime to war production.

But tomorrow, what? American industry will cease its present production—just as suddenly as it was started—and revert to its former activity. But it will face a different picture.

New needs will have been recognized and improved designs, methods and practices will be born.

To this future day we, like all farsighted manufacturers, are setting our sights.

Faced with engineering problems of most extraordinary character, we have naturally accumulated a great wealth of unparalleled experience, which added to the extensive experience we already possessed, enables us to make an exceptional contribution to industry—now and later.

ENGINEERS
DESIGNERS
CONSULTANTS

PIONEER ENGINEERING AND MANUFACTURING CO.

19649 JOHN R
DETROIT, MICH.

New Jersey in a movement to create a State organization pledged against the CIO and AFL.

Prime movement under foot at the moment is said to be the furtherance of plans to obtain exclusive bargaining rights in the five Wright Aeronautical Corp. plants here for a new union known as the Aircraft Workers of America (Ind.) an outgrowth of the now disassociated Wright Aeronautical Employees Association. The CIO, whose complaint to NWLB caused the restraining directive, is making a strong effort to obtain the exclusive bargaining rights.

Representatives from the 42 independent unions who attended the meeting indicated that the 165,000 members in their ranks would gladly join and support the newly formed Confederate Unions of America, a new power in organized labor which was formed about two months ago in Chicago to include all of the now independent unions under one powerful head.

•

Ickes Sees Relief In 7-Day Mine Week

• • • **Secretary Ickes,** Coordinator of Solid Fuels, expressed jubilance this week over the adoption of a seven day week for Western coal miners through an emergency action by the United Mine Workers of America. At the same time trouble closed a colliery in Wilkes-Barre over the wages in the midst of a new six day week regime in that area.

Ickes expressed real hopes for relief of the coal shortage situation when the UMWA granted miners in Washington, Oregon, Montana, Wyoming, Utah, Colorado and New Mexico the privilege of working a seven day week and stated that, "It is now up to the men who own the mines and those who work in them to make full use of this opportunity to produce every pound of coal they can possibly dig."

On the same day this declaration was made, operations halted in the Dorrance colliery of the Lehigh

---

AIRCRAFTERS: Rivet gals, as they are affectionately known, peddle ice cold rivets to assemblers in the Consolidated Aircraft Corp.'s works in San Diego with these tricycle carts usually associated with the ice cream man of the street corner. Granting that an attractive atmosphere helps, the ice cold rivets help too, not to cool the feverish worker, but because when warmed to room temperature they expand and thus hold more tightly.

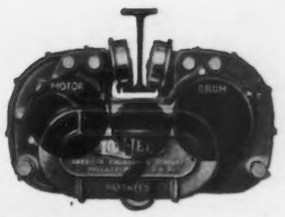
International News Photo

AMERICAN ENGINEERING COMPANY

The Lo-Hed Hoist Is Applicable To Any Monorail System. There's A Balanced Lo-Hed Electric Hoist For Every Purpose

Look in your Classified Telephone Directory under "A-E-CO LO-HED HOISTS" for your nearest representative

OTHER A-E-CO PRODUCTS:
TAYLOR STOKERS, MARINE DECK AUXILIARIES, HELE-SHAW FLUID POWER



And it's easy to see why BALANCE is important in an electric hoist

The other day one of our hoist engineers said to us: "In our advertisements we've talked a lot about the balanced design of the Lo-Hed hoist, how it achieves minimum headroom (for which no premium is charged), and allows us to use an efficient all-spur gear drive.

"I think we ought to tell people that balancing the motor and drum about the beam also enables us to design short, strong shafts that minimize torsional stresses and reduce the chances of failure. We might also say that the unique balanced construction of the Lo-Hed hoist permits the use of covers that can be removed with a screw driver to gain access to the motor, brake, cable or drum . . . good points in these times.

"And don't forget that though more Lo-Heds are built today than ever before they are as carefully precision-machined as they were in normal times. A Lo-Hed bought now for war work is an investment in the future." All right, Mr. Engineer, since you've said it all for us, we'll sign off by simply asking the reader of this ad to send in for his copy of the Lo-Hed catalog.

AMERICAN ENGINEERING COMPANY
2410 Aramingo Avenue, Philadelphia, Pa.

☐ Please send me your complete catalog of LO-HED HOISTS

☐ Ask your representative to get in touch with me promptly

Name .....

Company .....

Street Address .....

City ..... State .....
(Please Print Plainly)

Valley Coal Co. in Wilkes-Barre, Pa., as 1000 miners charged that they were unable to make a day's wages because the labor shortage had reduced them from two laborer-helpers to only one. The stoppage came as the anthracite industry started the six-day week to boost output. This is the fourth strike in this area since the government staged a good-will tour to increase output by improving morale.

Industry Warned on Draft Reclassifications

New York

• • • **Col. Arthur V. McDermott,** director of Selective Service for this city stated in a talk before the annual meeting of the American Trade Association here that reclassification of many 3-A and 3-B men will be required to attain a 7,500,000 man Army by the end of 1943. He warned that 1 million men would be called in both November and December and that an additional 3 million would be called next year.

Employers who have been lulled into a false sense of security through classifications of this type on their employees should look to gathering information on each employee which could be presented to back-up deferment requests. The titles "key men" and "executive" he said were now almost meaningless due to their broad usage to describe every sort of worker from assistant shipping clerks to $30 a week "executives." All employers should file necessary forms setting forth why employees are irreplaceable, was his parting advice.

•

Union Curbs Expected Result of Elections

Washington

• • • **Senator Davis (R., Pa.)** predicted this week that as a result of the changed political picture following last Tuesday's elections the labor unions may face curbing legislature. Possible curbs to be presented by encouraged Republicans included possible outlawing of the closed shop in war production plants, a requirement of federal incorporation for unions and public statements of union financial affairs.

•

FEPC Sets Policy on Hiring Discrimination

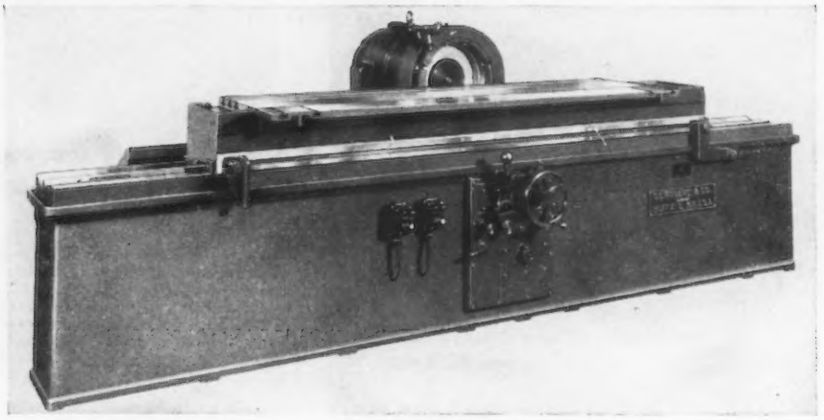
Washington

• • • **A concentration** of all responsibility for dealing with racial and other forms of discrimination in hiring has been officially centered in the President's Fair Employment Practice Committee this week following a meeting of Paul V. McNutt, WMC chief, and Dr. Malcolm S. MacLean, FEPC chairman.

The FEPC from now on will determine policy for the War Manpower Commission on enforcement of the President's Executive order which bans all forms of discrimination by war plants or government agencies.

FEPC will determine all procedures for investigating and redressing complaints and develop programs intended to insure the full and fair participation of workers in the war industries.

To Satisfy Repeated Inquiries



TYPE NT-20 CAPACITY 72" x 16" x 12"

We Announce the NT-20 ROGERS FACE GRINDER

Specially Designed for High Production of Long, Narrow and Light Work

Of heavy, rugged construction, this new model traveling table face grinder is built to take work 10" to 12" high. Table length is 72"; table width is 16". A 10 H.P. motor mounts a 20" cylinder grinding wheel for medium duty service. Two-speed table traverse powered by 3 H.P. Motor.

Built and guaranteed by a company with 56 years' experience in the grinding machinery field. Send for Circular NT-20.

SAMUEL C. ROGERS & COMPANY

215 DUTTON AVE. BUFFALO, N. Y.

ROGERS KNIFE GRINDERS

PRECISION QUALITY SINCE 1887

FEATURES OF DODGE V-BELT DRIVES

1. Matched quality sheaves and V-belts give team performance.
2. Sheaves made of close grained iron insure smooth grooves.
3. Accurately machined grooves provide proper belt seating.
4. "D-V" Belts have concave side walls which prevent bulging over sheaves.
5. D-V belts are cured under tensions require no adjustment.

BOMBS, shells and other munitions, months in the making, may be expended in minutes. Every wheel and shaft has a vital and unending responsibility — put *all* your power in the job turning them for Victory.

Dodge V-belt drives are delivering full power to millions of wheels and shafts, turning on round-the-clock schedules in the Victory production drive. More horsepower becomes battle power with Dodge efficiency and ruggedness providing safe, continuous passage for power.

Dodge V-belt drives are complete, modern power transmitting units. Sheaves and V-belts are of matched quality, assuring proper belt seating, saving wear and power — extending the life of drives and hard pressed motors. Sheaves are carefully machined—groove dimensions are uniform, each matching V-belt carries its share of the load. They maintain constant speed ratios at all speeds. No lubrication is required, eliminating any danger of oil damage to products.

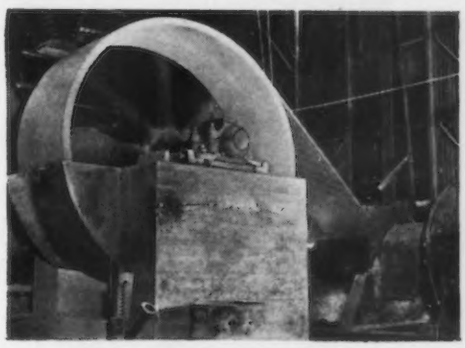
Put *all* your power in the job with Dodge V-belt drives on modern group drives and individual machines.

Dodge Distributors specializing in "The Right Drive for Every Job" provide industry with a source of supply from local stocks, including alternate selections.

DODGE MANUFACTURING CORPORATION, *Mishawaka, Indiana, U.S.A.*

How to Make V-Belts Last Longer

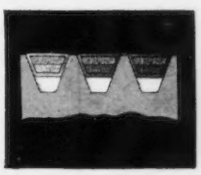
Driving sheave and driven sheave should be in exact alignment. This saves wear — prevents power waste . . . Slack off tension when mounting belts on sheave. Don't force them . . . It is wasteful to put new belts on excessively worn sheaves. Roughness shortens life of belts . . . If it is necessary to replace one or more belts on a drive, replace them all . . . Mount belts evenly so that belt tension is uniform . . . Don't overload — Dodge engineering and Dodge equipment assures "The Right Drive for Every Job."



A 300 HP. Dodge "D-V" Drive on Tube Mill Drive in Cement Mill. Important advantages are high ratio speed reduction — ability to absorb shock — substantial power savings.

D-V Belt on straight run shows concave side walls. Latex impregnation insures against cord separation.

D-V Belt around sheave shows how concave side walls expand on flexing over sheave.



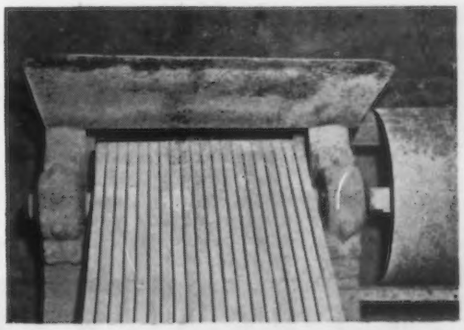
Accurately machined sheave grooves, match V-Belts dimension — give even pull on all belts.

When sheave grooves are not uniform, power loss and excessive wear results.

DODGE
MISHAWAKA

THE RIGHT DRIVE FOR EVERY JOB

THROW ALL YOUR SCRAP INTO THE SCRAP



This 200 HP. Dodge "D-V" Drive has been in operation for several years on a twenty-four hour a day schedule in a smelter. Dodge-Timken Type "C" Pillow Blocks, with triple steel seals, keep out dirt and retain lubricant. This prevents oil damage to belts.

PUT *ALL* YOUR POWER IN THE JOB

Freight Trains in Air No Longer a Dream, Evans Says

• • • **Studies** of trailer plane trains have not been comprehensive enough so far for anybody to say what can or cannot be done, according to Col. Edward S. Evans, president of Evans Products Co., Detroit, in a recent talk to 50 engineers and traffic experts representing the West Coast aircraft industry. The meeting was held in Los Angeles.

"If we had 25,000 planes like the C87 we could transport the freight now carried by the United States railroads which use 1,700,000 freight cars to transport it," he said. "But the costs are much higher than by rail."

However, Col. Evans continued, with trailer trains used literally as freight cars by tow planes, the cost of air freight would be greatly reduced. The tow plane should have a different center of gravity, a different propeller pitch, a different gearing and possibly different air foils than standard planes today, he said. Speeds up to 180 miles per hour are possible, he added.

"**You engineers** will probably tell me that theoretically a tow plane will carry only half its gross load in gliders and then only with a distinct loss in speed," he said. "Yet I have figures from experiments in Poland showing that this theory does not hold true and that with assisted take-off gliders can be put in the air that will carry a greater pay load by three to one than can be carried in the tow plane. The gliders can be built from one-fifth to one-third the weight with a wing loading that would be such as to give you a gliding ratio of ten to one.

"There has been too much tendency on the part of all of us, including the Government, airplane makers and even plane operators, to accept as standard the designs that we have when, in fact, these designs by the time they reach the production stage are already obsolete.

"I was told by our engineers in 1929 that 50,000 lb. was the ultimate in weight that could ever be carried by an airplane and that if we went further we would have to look to lighter-than-air craft. Today Grover Loening is talking about a 750,000-lb. airplane. Glenn Martin already has designed one which will have a gross loaded weight of 250,000 lb.

"There is no such thing as 'can't' and human ingenuity is inexhaustible."

Speaking of versatility—here's one day's production in a Detroit Electric Furnace

Coal pulverizer hammers—3.75% total carbon.

A Nickel-molybdenum heat—2.65% total carbon.

Heat resistant stoker parts (molybdenum-chrome iron), 2.90% total carbon.

Housings and small soft castings of plain iron—3.50% total carbon.

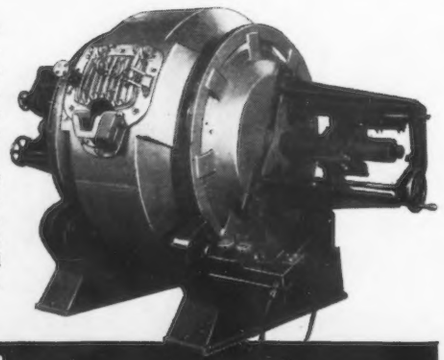
Marine cylinders of nickel-chrome, molybdenum iron—3.10% total carbon.

Cover plates cast of a special white iron—2.15% carbon—subsequently heat treated.

Nickel-chrome cylinder liners 3.25% total carbon; and large marine piston rings poured from the same iron.

You will note in this typical example of one day's production that castings ranged in carbon content from 2% to 3.75%. Plain and alloyed irons—both white and gray irons—were run throughout the day in rapid sequence as desired.

In addition to versatility, the Rocking Electric Furnace is fast and efficient. Easy to use, it results in a higher percentage of good product, lower metal losses, less labor, less plant space and the frequent use of salvage materials. Write for further facts.



DETROIT ELECTRIC FURNACE DIVISION

KUHLMAN ELECTRIC COMPANY • BAY CITY MICHIGAN

WLB Appoints Dougherty Wage Control Head

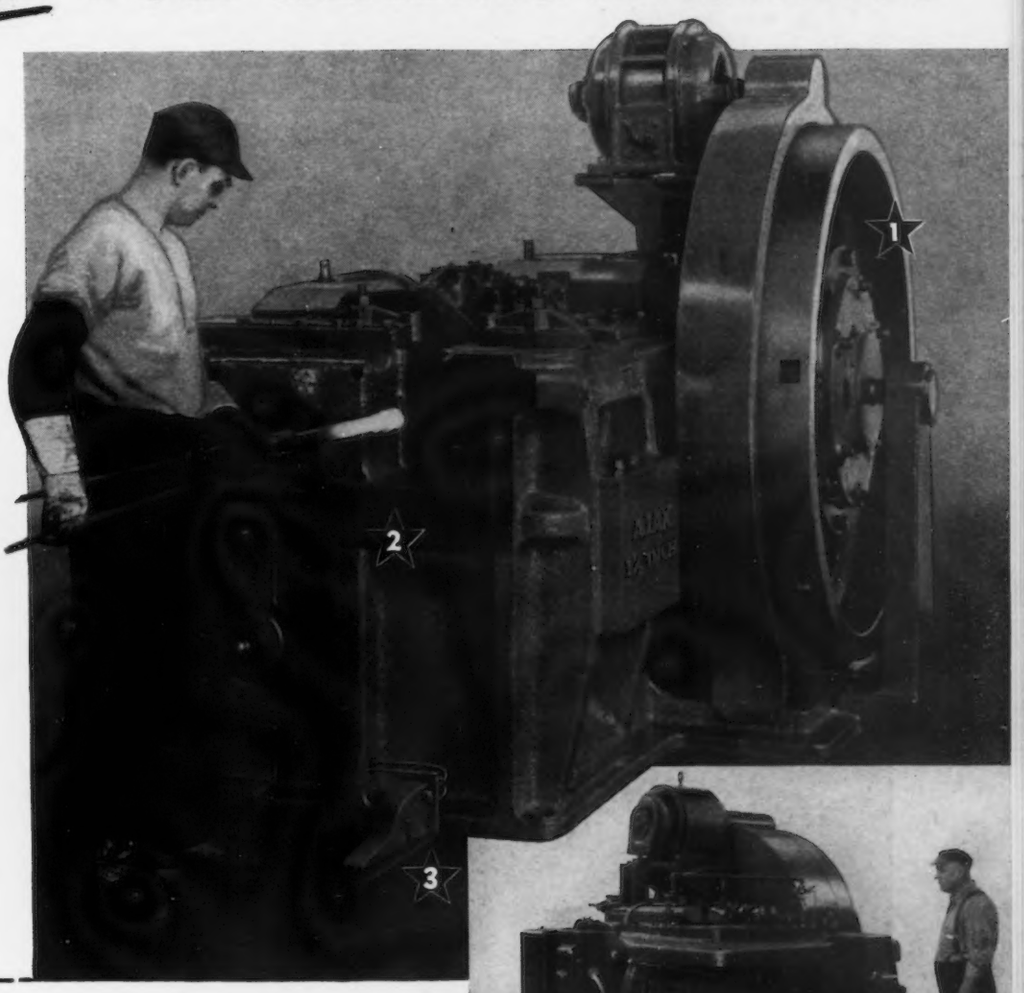
• • • **The War Labor Board** announced this week the appointment of Carroll Dougherty, a professor of Hunter College, New York, to head the special section which will administer wage controls granted to WLB by the recent OES directive.

This special section of WLB, which has been created for wage administration, has been authorized by the Office of Economic Stabilization to rule on all wages of organized labor and on all salaries up to $5,000 a year.

HIGHER BOLT AND RIVET PRODUCTION WITH AJAX *Air Clutch* BOLT HEADING MACHINES

3 Reasons why

- Instantaneous response of Direct-Acting Air Clutch at high operating speeds.
- Easier feeding due to convenient feed gap design and correct operating height.
- Effortless tripping of treadle —permits operator to work in well balanced position.



Ajax Bolt Heading Machine equipped with continuous motion rivet attachment for making bolts or rivets off end of the bar.

BECAUSE of the quick response of the Direct-Acting Air Clutch which engages at *any* point in its operating cycle, the output of Ajax Bolt Heading Machines is limited only by the ability of the operator to feed stock. Feeding has been greatly facilitated by removing interfering projections from the feed gap and by providing correct operating height through deepening the frame below the feed gap, which at the same time results in greater frame rigidity. The treadle operating the Air Clutch is tripped effortlessly and can be shifted wherever it is most convenient for the operator to avoid fatigue, enabling him to work in a well balanced position at all times. Another factor in maintaining the consistently high production possible on these machines is the smooth, shockless starting at high operating speeds which eliminates the rack and jar that formerly attended clutch engagement and caused a disproportionate amount of "down time" for repair. These all-important production benefits inherent in Ajax Bolt Heading Machines serve to emphasize the wisdom of purchasing forging equipment on the basis of mechanical soundness.

Send for Bulletin No. 64.

BUY FORGING EQUIPMENT ON THE BASIS OF MECHANICAL SOUNDNESS

THESE AJAX FEATURES ASSURE VITAL WAR PRODUCTION BENEFITS

Direct-Acting Air Clutch
Steel Bed with Integral Housings
Extension Guided Header Slide
Outboard Guided Die Slide Bearing
Toggle Die Grip with Automatic Safety
Automatic Lubrication

THE AJAX MANUFACTURING COMPANY

EUCLID BRANCH P. O. CLEVELAND, OHIO

621 MARQUETTE BUILDING • CHICAGO, ILLINOIS

Rep. Eliot Considers WLB Regional Chiefship

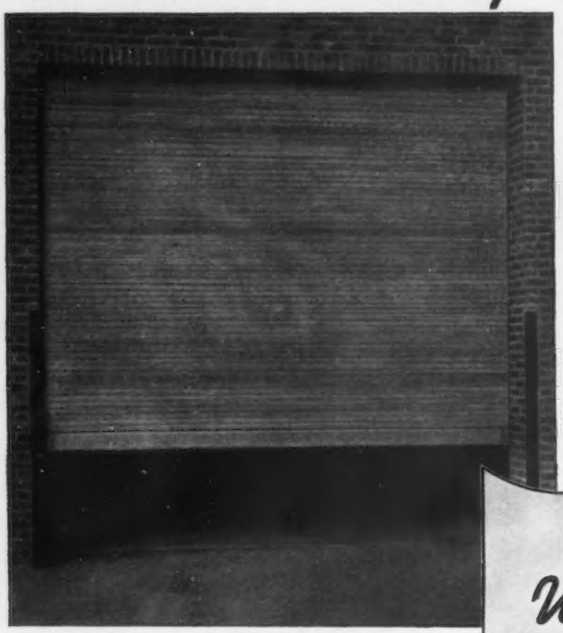
Boston

• • • **It was learned here** this week that the WLB had offered Representative Eliot (D. of Mass.) a position as regional director of WLB for the Northeastern area, presumably their region I.

Regional directorship for WLB has recently taken on new significance with the additional duties of acting as local wage control czar under the recently announced plan of WLB to utilize 10 regional WLB offices and about 100 Wage and Hour offices in handling the details of the anticipated deluge of wage control questions and decisions emanating from the wage freezing orders of OES director Byrnes.

☆☆☆☆ KINNEAR ☆☆☆☆
☆☆☆☆ ☆☆☆☆

WOOD *Rolling* DOOR



SAVE STEEL *but still* GAIN TIME TESTED EFFICIENCY *of* COILING OPERATION

for Wartime Needs

Makers of the famous Kinnear Steel Rolling Door again come to Industry's aid with their WOOD Rolling Door. It saves steel without sacrificing efficiency! It features coiling, upward-acting efficiency, proved for so many years in steel rolling door installations!

The wood-slat curtain is assembled for strength, weather protection and smooth operation. Spring counterbalanced and coiling above the lintel, it saves space . . . leaves an unobstructed opening . . . opens out of the way of damage. Built any size, manual or motor operated, and suited to old or new installations. It is the perfect answer to "duration" door problems.

Write Today for BULLETIN No. 37

THE KINNEAR MANUFACTURING COMPANY
1760-80 Fields Avenue Columbus, Ohio

☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆

Acme Photo

CHAO HING CHU: This Chinese worker, with the strange name, has worked in the Ford tool and die plant since 1925. His ambition is to teach workers in China the mysteries of machine operation. Shown operating a drill press in the Ford plant now, he hopes to open his own machine shop in China some day.

Engineering Construction Triples 1941-Week Total

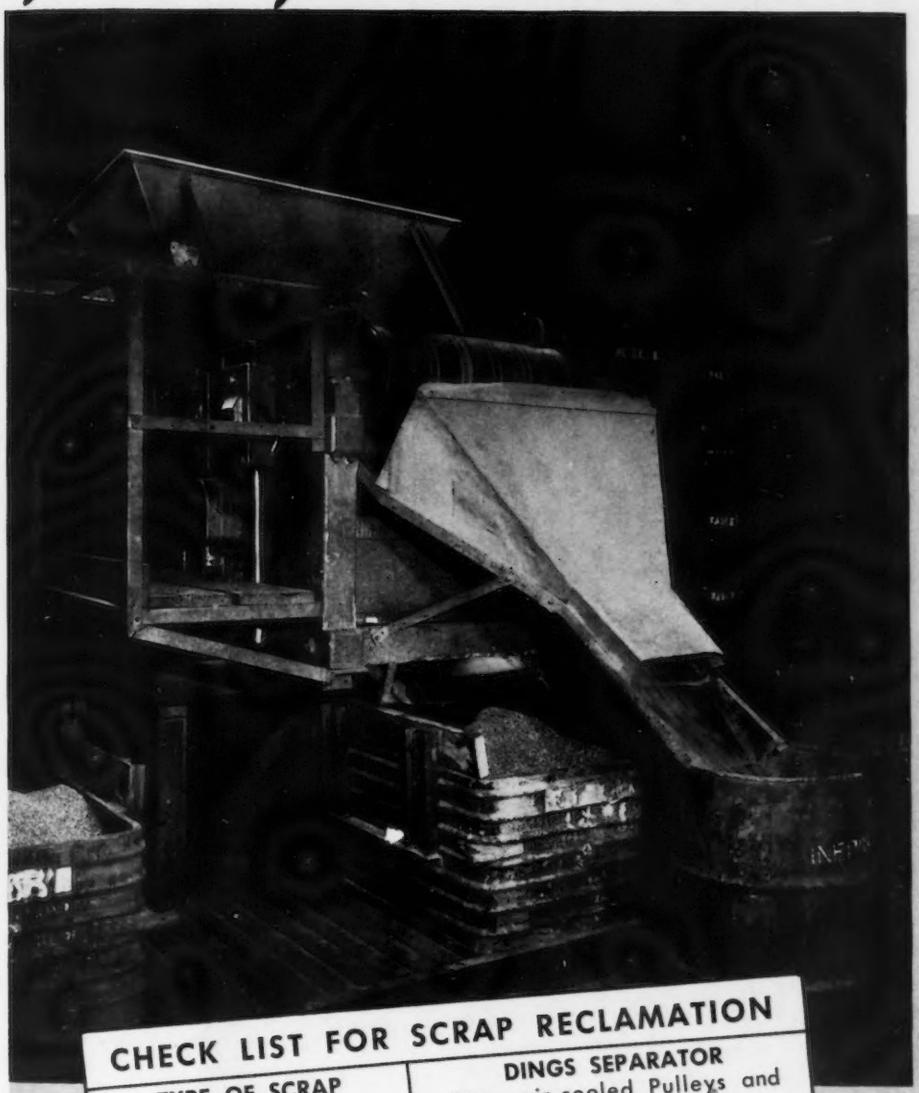
New York

• • • **Engineering construction** volume for the short week due to the Election Day holiday totals $137,412,000, more than triple the volume for the corresponding 1941 week and above the $103,282,000 reported for the preceding week by *Engineering News-Record.* Federal construction accounts for 91 per cent of the current week's total and is 428 per cent higher than a year ago. The increased federal volume boosts public construction 292 per cent above last year. Private work, however, is 25 per cent below the 1941 week.

The week's volume brings 1942 engineering construction to $8,461,997,000, an increase of 60 per cent over the $5,294,419,000 reported for the 45-week period a year ago.

Speed up SCRAP RECLAMATION

with DINGS MAGNETIC SEPARATORS



THE Dings High Intensity Magnetic Separator illustrated, installed at the Whiting, Indiana, plant of Federated Metals Division, is used for high capacity purification of non-ferrous turnings and borings. One of several types of Dings Separators installed, it is typical of the equipment Dings offers to speed up scrap reclamation for the war effort.

No matter what your scrap reclamation problem is, you'll find modern Dings equipment designed to handle it. Installations can be made to fit the most special requirements. For better, faster, labor-saving scrap reclamation, consult Magnetic Separation Headquarters now. Ask for a copy of Magnetic Alchemy, 8 page bulletin on Dings equipment for the metal industries.

DINGS MAGNETIC SEPARATOR CO.
516 East Smith Street
Milwaukee, Wisconsin

CHECK LIST FOR SCRAP RECLAMATION	
TYPE OF SCRAP	**DINGS SEPARATOR**
1. Removal of contaminating iron from non-ferrous parts and pieces.	Dings air-cooled Pulleys and Pulley Type Separators for capacities to over 15,000 cu. ft. per hr. Portable models available.
2. Purification of non-ferrous turnings and borings.	Dings Drum Type Separators with capacities comparable to pulleys of similar size. Type DA Dual Pulley Type Separators with 2 separation points. Revolving Disc Type M Separators. Successful for over 40 years.
3. Intimately entangled scrap such as results when babbitted pillow blocks are bored or grooved for lubrication channels.	A new type separator to do a job once impossible! Combines mechanical and magnetic agitation to pull tangled ferrous and non-ferrous particles loose from each other.

Dings MAGNETIC SEPARATION HIGH INTENSITY

Less Fatigue... faster inspection with the NEW MICRO-CHEK

Thread-gaging anvils for pitch diameter and thread leads are available.

LESS fatigue, faster inspections, are speeding up the gaging of millions of precision parts in more than 800 war plants which are now using the new Trico MICRO-CHEK.

Many big industries have installed scores of these new comparator gages as a result of testing out a trial instrument. They found these advantages:

1. Greater speed with no sacrifice of accuracy; **2.** Faster reading, less eye-strain and fatigue on operators; **3.** Original accuracy continuously retained by re-setting with original master parts; **4.** Inexperienced workers quickly become accurate inspectors; **5.** Special fixtures or anvils for holding parts to be inspected require less accuracy and cost less to make.

Multiplies dimensions by 200.

A BRAILLE TYPE...

readable by finger touch... to open inspection jobs for the blind.

TRICO MICRO-CHEK
TRICO PRODUCTS CORP.
40 Goodell Street
Buffalo, N. Y.

Expansions by Ford And Caterpillar Approved

Washington

• • • **Defense Plant Corp.,** RFC subsidiary, has authorized the following contracts:

Ford Motor Co., Dearborn, Mich., to provide for additional plant facilities in Michigan at a cost in excess of $650,000, making a total commitment of more than $33,500,000.

Caterpillar Tractor Co., East Peoria, Ill., to provide additional plant facilities in Illinois at a cost in excess of $400,000, making a total commitment of more than $1,000,000.

Sprague Specialties Co., North Adams, Mass., to provide for plant facilities in Massachusetts at a cost in excess of $750,000.

General Electric Co., Schenectady, N. Y., to provide for additional equipment in a plant in Connecticut at a cost in excess of $250,000, making a total commitment of more than $500,000.

General Electric Co., Schenectady, to provide additional equipment in plants in Connecticut and Indiana at a cost in excess of $80,000, making a total commitment of more than $300,000.

Stetson-Ross Machine Co., Seattle, Wash., to provide for construction and equipment of a plant in the state of Washington at a cost in excess of $250,000.

The Commercial Fuel Co., Pittsburgh, Kan., to provide machinery and equipment in Kansas, at a cost in excess of $175,000.

Atlas Imperial Diesel Engine Co., Oakland, Cal., to provide machinery and equipment in Illinois at a cost in excess of $100,000.

Universal Television System, Inc., Kansas City, to provide for equipment for a plant in Missouri.

Tom Moore Distillery Co., Bardstown, Ky., to provide equipment for plant in

Kaiser Steel Expansion Given Formal Approval

Washington

• • • **Formal approval** for enlargement of the Kaiser Co. steel plant at Fontana, Cal., was given last week with announcement by the RFC that it had authorized a loan of $26,000,000 for the construction of additional facilities. They include two open hearth furnaces; a structural mill; a merchant bar mill; alloy finishing facilities and soaking pits. Last spring RFC loaned the Kaiser Co. $55,000,000 for the construction of coke ovens, a blast furnace, open hearth furnaces and a plate mill.

Welding Contest Announced

• • • **Metal & Thermit Corp.** has announced the third in a series of contests for photographs and descriptions of welded work. The contest, which closes Dec. 15, is designed to further interest in arc-welding. Twenty-six prizes will be awarded, ranging from $100 to $5 war bonds. Similar contests were held in July and September.

GOOD GUTS *that help speed* BILLET GRINDING!

This is one of a battery of Reading Chain Hoists, helping to keep production on schedule in the Grinding Department of a steel mill. It's a job that demands solid hoist construction—the guts to take hard knocks for hours on end!

Whether you use Reading Chain Hoists or Reading Electric Hoists, you'll find that they are *engineered* to stand up under hard use, save man-hours and cut maintenance time.

If you would like help in selecting the hoists to meet your specific needs, a note on your company letterhead will start a copy of "*Modern Materials Handling Magic*" on its way to you. This 16-page booklet is offered to help you get the most from every dollar you invest in hoist equipment.

READING CHAIN & BLOCK CORP.
DEPT. A-12 **READING, PA.**

READING
Chain Hoists, Electric Hoists, Cranes and Monorails

81 New Vessels Delivered in October

• • • **American shipyards,** engaged in building merchant ships for the Victory Fleet, delivered into service 81 vessels totaling 890,700 tons deadweight in October, the Maritime Commission announced Nov. 4. The October figure brings total ship production for the year to approximately 6,000,000 deadweight tons.

The month's deliveries were 12 vessels short of the record breaking production of 93 merchant ships in September. This was due, the Commission stated, to the temporary diversion of a considerable amount of the merchant shipbuilding capacity to emergency construction of special craft for the Armed forces.

Of the 81 vessels delivered in October, 65 were Liberty ships, three cargo carriers for British account, eight C-type, four large tankers and one ore carrier. West Coast yards led the construction parade by putting into service 43 vessels. East Coast yards de'ivered 24 ships, Gulf Coast yards 13 vessels, and one ship was completed on the Great Lakes.

Two West Coast Yards, California Shipbuilding Corp., Wilmington, Cal., and the Oregon Shipbuilding Corp., Portland, Oregon, were tied for individual honors, each delivering 12 ships. Richmond Shipyard No. 2 of the Permanente Metals Corp., Richmond, Cal., took third place by delivering 10 vessels, while the Corporation's Richmond Shipyard No. 1 delivered seven ships. The month also saw the first Liberty ship to be delivered by the W. A. Bechtel yard at Sausalito, Cal.

30 Refineries Asked for More Petroleum Coke

• • • **To increase** the production of raw petroleum coke, approximately 30 refineries are being called upon to raise their output of this product, Petroleum Coordinator for War Harold L. Ickes announced Nov. 5.

Alemite Name Omitted

• • • **Correcting an omission** from the Oct. 1 issue of THE IRON AGE, the Alemite Div. of Stewart-Warner Corp., Chicago, should have been included in the Products Index under the heading "Lubricants, Industrial."

quality BUILT IN!
BARBER-COLMAN
The correct oil film to each individual bearing... automatically
Machine accuracy is maintained at maximum by Bijur lubrication. This centralized forced-feed system promotes better-quality work . . . higher speeds . . . bigger production at lower cost . . . longer-lived machines. Each bearing is fed automatically—the exact, metered oil-film demanded by its size, speed, load. Bijur lubrication is engineered to modern machine standards!
BIJUR LUBRICATING CORPORATION • LONG ISLAND CITY, NEW YORK
BIJUR
AUTOMATICALLY Correct LUBRICATION

Serving the Airplane Plants
USERS:
Curtiss-Wright
Boeing Aircraft
Republic Aviation
Lockheed Aircraft
Etc.
A large aircraft manufacturer writes: "Krane Kar is used in the production of Flying Fortresses: handling jig sections in erection; handling steel for jig sections; unloading equipment from flat cars; loading aircraft spare parts and assemblies on cars; placing large pieces of production equipment and handling repair parts for same when necessary; lifting, moving, and rearranging production equipment, raw materials, etc.; for building maintenance and repair, etc." Write for details.
"KRANE KAR TRANSPORTING AIRPLANE MOTOR"

Kranekar SWING BOOM TRACTOR CRANE
2½, 5 & 10 TON CAPACITIES

SILENT HOIST WINCH & CRANE CO., 851 63RD ST., BROOKLYN, N.Y.

Open Capacity on

ELECTRIC SEAM WELDING

(longitudinal & circular)

PRESS BRAKES

(up to ¼" capacity)

ALL PHASES OF METAL FABRICATION

We have a completely equipped tool room, conveyorized paint shop, draw presses, punch presses, arc, spot, and acetylene welding.

Complete Engineering Service

Accurate Close Work

HARRISON SHEET STEEL COMPANY
4718 west Fifth avenue, Chicago

PRICES

Chrome Ore Price Schedule Based on First-Half Level

• • • **Ceiling prices** for chrome ores were issued Nov. 4 in Schedule 258, effective Nov. 9.

The ceilings for metallurgical and chemical chrome ores are at approximately the levels prevailing during the first six months of 1942. Those approved for refractory ores are somewhat under present levels, but above those charged in the first half of this year. The new maximums are:

1. $43.50 per gross ton for metallurgical-chemical chrome ores of a base analysis of 48 per cent chromic oxide and 3 to 1 chromium-iron ratio, f.o.b. railroad cars at New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Ore., or Tacoma, Wash., whichever is the buyer's most favorable basing point. Montana ores, however, are priced f.o.b. railroad cars at Columbus, Mont., with an allowance to the buyer for actual freight up to $7 per gross ton. Premiums and penalties are provided for deviations in chromic oxide content and in the chromium-iron ratio.

2. $31 per gross ton for lump refractory chrome ore in bulk, f.o.b. railroad cars at Baltimore, Philadelphia, Chester, Pa., or San Francisco, whichever is the buyer's most favorable basing point.

3. $35.55 per net ton for lump refractory chrome ore packed in single cloth sacks, $38.30 in double cloth sacks, and $40.80 in barrels, f.o.b. railroad cars at Baltimore, Chester, Pa., or Plymouth Meeting, Pa.

4. $36.50 per net ton for ground refractory chrome ore, 24 mess or coarser, f.o.b. railroad cars at Baltimore, Chester, Pa., or Plymouth Meeting, Pa.

Exempt from the regulation are sales of chrome ores to the United States Government or its agencies. Also exempt are sales of ores where the contract of sale is made and title vests in the buyer while the ore still is outside the continental United States. This permits the purchase of ore f.o.b. a foreign port at prices which will result in a delivered cost in excess of the ceilings established by this maximum price regulation. However, OPA will entertain no petition for relief based on excessive ore costs where ore is purchased abroad under this exemption.

Sales by the Government and its agencies, including the Metals Reserve Co. are covered by the regulation. In effect, this means that Metals Reserve may continue to pay whatever prices it deems necessary to stimulate domestic production and assure the importation of a sufficient volume of foreign ores. At the same time it will sell ore from its stockpile to American industrial users at prices no

higher than the established maximums.

Before issuance of the new chrome ore regulation, only domestic sales of foreign ores to a private buyer were subject to price control.

•

Export Sales of Chrome Ore

• • • **A maximum** export premium of $6 per gross ton on export sales of chrome ores and concentrates of 38 to 44 per cent chromic oxide content, the only type now exported, was established Nov. 3.

The premium is authorized in Amendment No. 3 to the Revised Maximum Export Price Regulation, and was effective Nov. 9.

•

Builders' Hardware Order

Washington

• • • **OPA on Monday** made public Maximum Price Regulation 261, effective Nov. 13, fixing ceilings for all contract, or lump sum, sales of builders' hardware. Previously sales by manufacturers and distributors were covered by Revised Price Schedule No. 40, Builders' Hardware and Insect Screen Cloth.

The new regulation established maximum prices for manufacturers at the highest price received by the manufacturer for delivery between Oct. 1, 1941, and March 31, 1942, of finishing builders' hardware of approximately the same grade, quality and amount for a similar building project and to a purchaser recognized under trade practices as entitled to similar treatment.

•

Substandard Ferromanganese

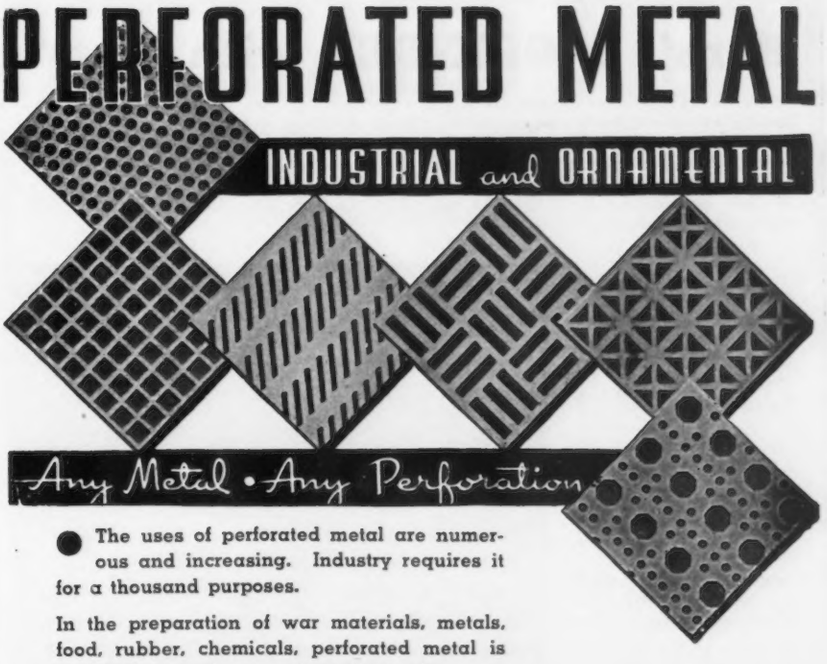
• • • **Maximum prices** for substandard ferromanganese sold by persons who did not sell this commodity during March, 1942, and whose closest competitors made no sales in March were issued Nov. 3 by OPA.

The prices are $120 per gross ton, f.o.b. Atlantic seaboard, less $1.50 per gross ton for each 1 per cent of contained manganese below 78 per cent.

Prices for standard ferromanganese are provided in Maximum Price Regulation No. 138 (Standard Ferromanganese.) The substandard commodity, however, is priced under the General Maxi-

PERFORATED METAL

INDUSTRIAL and ORNAMENTAL

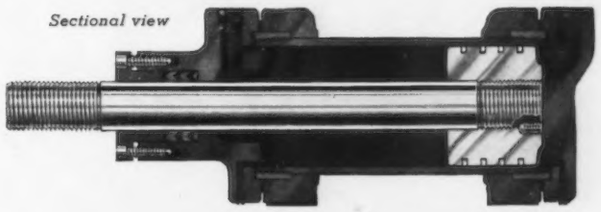


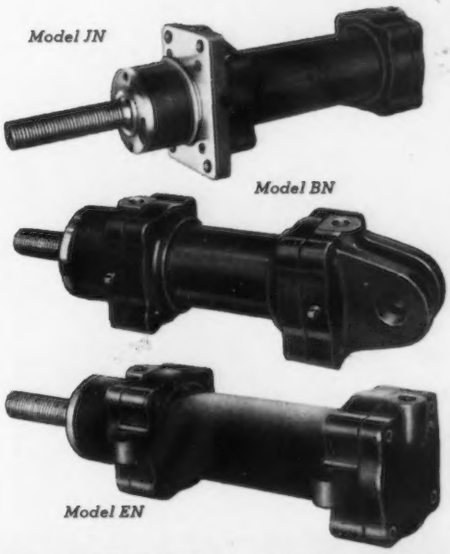
● The uses of perforated metal are numerous and increasing. Industry requires it for a thousand purposes.

In the preparation of war materials, metals, food, rubber, chemicals, perforated metal is required to perform an important role.

The Harrington & King PERFORATING Co.

5657 FILLMORE STREET—CHICAGO, ILL.
New York Office, 114 Liberty Street





Stronger, Simpler hydraulic cylinder design

Hannifin hydraulic cylinders have the patented no-tie-rod design that means a stronger cylinder assembly, simpler application, and easy adaptability to many different uses. Precision construction, with honed cylinder bore, assures high efficiency utilization of hydraulic power, with minimum fluid slip. Write for cylinder bulletin 35-A, giving complete specifications.

HANNIFIN MANUFACTURING COMPANY
621-631 South Kolmar Avenue · Chicago, Illinois

HANNIFIN HYDRAULIC CYLINDERS

Here's a GRINDER with 'guts'

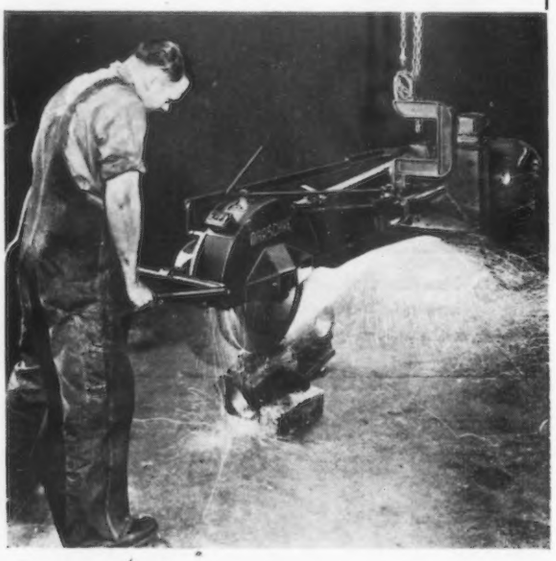
Marschke Swing Frame Grinders are made entirely of steel. There is no breakage. Spindle bearings have double protection against entrance of grit. The totally enclosed motors are dust-proof. The pulleys and belts are shielded against damaging effect of sparks. All adjustable parts are also protected. Marschkes are built to live through severest operating conditions, to operate efficiently when at their best and they are at their best during long life with minimum maintenance. THUS it pays to USE Marschke Swing Frame Grinders.

★ ★ ★

Write for Complete MARSCHKE Catalog to **VONNEGUT MOULDER CORP.**, 1843 Madison Ave., Indianapolis, Indiana.

★ ★ ★

"Laboratory view" of a Marschke Swing Frame Grinder undergoing tests for study of spark action. Notice how elimination of outboard bearings gives the operator a clear view of the work area.



MARSCHKE QUALITY GRINDERS AND BUFFERS

VONNEGUT MOULDER CORP. INDIANAPOLIS

JOHNSON XLO Music Wire

Complete stock in Worcester, Akron and Los Angeles warehouses.

Standard mill coils—25 to 100 lbs. Packages—1/4 lb., 1/2 lb., 1 lb. Wire sizes from .003 to .200.

JOHNSON STEEL & WIRE CO., INC.
WORCESTER ★ MASSACHUSETTS.

mum Price Regulation, which provides that ceilings shall be the highest prices in March, 1942.

Sellers without March prices, or without a competitor who sold the product in March and from whom a selling price could be obtained, are given the $120 per gross ton price in Order No. 115 under Section 3 (b) of the General Maximum Price Regulation, effective Nov. 3.

Substandard ferromanganese is defined as any high carbon ferromanganese containing less than 75 per cent metallic manganese by weight. It may be either ferromanganese that fails to meet standard specifications, or a mixture of small pieces and dust scraped from the bottom of a storage bin. The substandard product today is reprocessed into standard ferromanganese, used in the manufacture of other manganese alloys or used directly in the production of steel.

Can Firm's Plea Denied

• • • **A petition for** price adjustment by Continental Can Co. Inc. of New York was denied by OPA on Oct. 29.

The company in its plea stated that under its standard contract with its customers for containers made of black plate, it was entitled to increase the prices for such articles by the amount of any freight increase on shipments to it of black plate, and pointed out that railroad freight rates went up 6 per cent last March. This increase entitled the company to boost price of deliveries under its standard contract for points east of the Rockies but the company did not establish the increase until April 14, retroactive to April 1, the petition said, adding that on July 14 the increase was revoked by letter to its sales organization retroactive to May 11, with instructions to issue credits and to advise customers that such credits were issued pending the decision of its appeal to OPA.

The application stated that the petitioner did not establish this price increase on March 18 because it was generally expected the price of black plate would be increased April 1; that such increase published would also have entitled the petitioner to make a corresponding increase in the price of containers made of such

material; that it was decided to make the two increases effective at the same time; that no such increase in the price of black plate was announced and that accordingly the company established the increase as outlined above.

•

Tool Dealers Licensed

• • • **A provision** licensing dealers in second-hand machine tools or parts, other than those selling at retail, was incorporated by the Office of Price Administration into Revised Price Schedule No. 1, Second-Hand Machine Tools, and into Maximum Price Regulations No. 136—Machines and Parts and Machinery Services.

This action was taken through Amendment No. 1 to Revised Price Schedule No. 1 and Amendment No. 37 to Maximum Price Regulation No. 136. The amendments were effective Nov. 9.

OPA licenses are granted as a condition for doing business and may be revoked by a court for repeated violation of price regulation.

Retailers are automatically licensed under the General Maximum Price Regulation.

•

Foreign Ore Prices

• • • **At New York** last week, prices of foreign ores were being quoted as follows in conformity with new government price control regulations:

Exclusive of Duty
(Includes marine and war risk insurance)

	F.O.B. Cars, Mobile and New Orleans	F.O.B. Cars Norfolk Baltimore Philadelphia, New York
Brazilian, 48% Mn.	73.8c.	78.8c.
Brazilian, 46% Mn.	71.8c.	76.8c.
Caucasian, 51% Mn	75.3c.	80.3c.
Caucasian, 50% Mn	74.8c.	79.8c.
Chilean, 48% Mn..	73.8c.	78.8c.
Indian, 50% Mn....	74.8c.	79.8c.
Indian, 48% Mn....	73.8c.	78.8c.
So. African, 48% Mn	73.8c.	78.8c.
So. African, 46% Mn	71.8c.	76.8c.
Duty Free Ores		
Cuban, 51% Mn....	86.5c.	91.5c.
Cuban, 48% Mn....	85.0c.	90.0c.
Cuban, 45% Mn....	82.0c.	87.0c.
*Philippine, 50% Mn	85.0c.	90.0c.
**Domestic, 48% Mn	96.0c.	96.0c.

*Nominal.
**F.o.b. mines.
All prices are per gross ton unit, dry.
Penalties are assessable in accordance with Price Regulation 248 on any variation in analysis.
Prices are based on ore analyzing: iron 6% max.; alumina plus silica 11% max.; phosphorous 0.18% max.

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G. A. WELDING Shop Notes

AFTER THE WAR...WHAT?

Many producers are already considering plans for the time when the national emergency will be over. Obsolete and worn-out equipment must be replaced. New processes, new developments will require additional and different installations. It is good judgment to prepare for the future. The engineers and chemists of General American's Plate & Welding Division welcome an opportunity to counsel with you on immediate or future problems involving steel plate equipment.

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Taxes, Back Pay Cut Steel Income Deeply

• • • **Devastating effects** of state and federal income taxes, excess profit taxes and the costly inroads of retroactive pay decisions by the WLB are plainly reflected in steel industry reports of net corporate incomes for the quarter ending Sept. 30 and for the first nine months of this year.

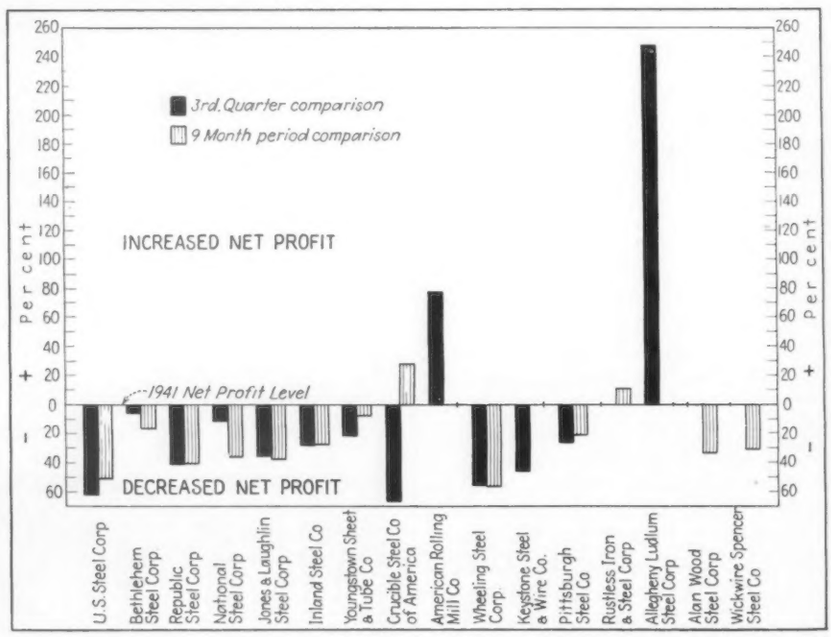
Although complete figures for the entire industry were not available at press time, an analysis of some of the leaders of the industry serves to prove that net profits are shrinking fast.

United States Steel Corp., for instance, has dropped from $34,313,345 for the third quarter of 1941 to $12,628,836 in the quarter ending Sept. 30—a decrease of 63.2 per cent. A similar decrease is shown in the comparison of the 9 months total against the same period a year ago—a drop of 51.4 per cent. The exceedingly steep drop for the third quarter of this year was attributed not only to the inroads of high taxes, which totaled $44,600,000 in federal taxes alone, for the quarter, but also to the added burden on this quarter's earnings of $8,600,000 paid out in retroactive wage increases. The federal taxes for the nine months totaled $161,600,000. This compares with $82,285,500 for the same period last year. In addition to the federal income and excess profits taxes which are responsible for these astrological totals, there must also be considered, in every instance, the state income taxes, local taxes and social security levies. In the case of U. S. Steel these were $21,718,328 for the third quarter alone and $54,142,757 for the nine months.

Tax and wage-increase costs cut into the share earnings by many times more than the share paid. For instance, the cost of the retroactive wage payment in the U. S. Steel case, $14,600,000, represented an earning of about $1.68 per common share over the nine month period. The corporation paid $1 on common stock for the quarter. It was estimated by the corporation that had the third quarter borne only the payroll increase actually attributable to work done during the quarter that

Third Quarter Comparison of Net Profits

• • • **The graphically illustrated net profits of major steel firms reporting net profits for the third quarter and for the first nine months of 1942 are shown compared with net profits reported for like periods last year, figured in per cent of increase or decrease.**



net profit would have been $8,600,000 higher or about $1.71 a common share.

In addition to the taxes and assessments actually paid out each quarter, every concern is forced to set aside funds to care for succeeding taxes and contingencies of peak employment and production, plus in many cases, separate funds for wage increases which have not yet been granted by WLB but which are anticipated in view of all recent decisions of the board.

Every major steel producer reported similarly this quarter and each showed a definite drop in net profit due in greater or lesser measure to taxes and costly decisions by WLB.

Bethlehem Steel Corp, reporting for Bethlehem Steel Co. and subsidiaries, shows the least decrease of any of the big producers with a drop in profit for the quarter of 5.9 per cent compared with the third quarter of 1941. For the nine month period comparison, the decrease in profit is slightly greater, 18 per cent, which is believed to be because its WLB wage decision came earlier in the year and was not retroactive over quite such a long, costly period. Republic Steel, although now making more steel than the total output of the Japanese Empire, showed a decline in net profit for the quarter of 41.1 compared to the same quarter last year and only slightly less, 40.8 per cent for the nine month period, compared with 1941.

Other major producers reporting showed widely varied decreases dependent in each case on individual problems and costs. National Steel Corp. dropped 11.3 per cent for the quarter and 36.4 over the nine month period. Jones & Laughlin was fairly consistent in losing profits as compared with the previous equivalent periods, showing a 35.6 per cent drop in the quarterly comparison and 38.0 for the nine months. By the same comparison, Inland Steel Co. decreased 28.2 and 27.9 per cent respectively; Youngstown Sheet and Tube Co. showed a decrease of 20.8 for the quarter comparison but only 8.1 per cent for the nine months. Wheeling Steel Corp. decreased 55.2 per cent for the quarter and 56.8 per cent for the nine months. Crucible Steel Co. of America although down 65.7 for the quarter showed an increase of 21.9 for the nine months comparison. Both American Rolling Mills and Allegheny-Ludlum reported increased net profits for the third quarter of this year compared with the same quarter of last year.

Follansbee, Blaw-Knox Report for Third Quarter

Pittsburgh

• • • **Follansbee Steel Corp.** reports net profit of $303,871 for the nine months ended Sept. 30, after taxes and all charges including depreciation and amortization of war facilities. The profit was equivalent to 95c. a share on common

BULL'S EYE

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THIRD QUARTER NET PROFITS REPORTS

Including decreases in net profits compared with like periods of 1941

	1942				1941				Quarter Comparison Decrease in Net Income %	Nine Months Comparison Decrease in Net Income %
	3rd Quarter Net Income	Per Common Share	Nine Months Net Income	Per Common Share	3rd Quarter Net Income	Per Common Share	Nine Months Net Income	Per Common Share		
U. S. Steel Corp.	12,628,836	.72	46,495,743	3.16	34,313,345	3.21	95,688,091	8.82	63.2	51.4
Bethlehem Steel Corp.	7,444,870	1.94	19,686,471	4.94	7,910,569	2.10	23,998,054	6.39	5.9	18.0
Republic Steel Corp.	2,581,100	.37	10,653,221	1.61	4,378,379	.68	17,997,095	2.90	41.1	40.8
National Steel Corp.	2,838,883	1.29	8,265,166	3.75	3,200,452	1.45	12,992,271	5.86	11.3	36.4
Jones & Laughlin Steel Corp.	2,539,716	2.04	7,470,186	5.98	3,942,157	3.16	12,040,384	9.64	35.6	38.0
Inland Steel Co.	2,642,409	1.62	8,113,890	4.97	3,675,724	2.25	11,247,342	....	28.2	27.9
Youngstown Sheet & Tube Co.	2,459,652		7,327,350		3,103,649		7,971,347		20.8	8.1
Crucible Steel Co. of America	2,135,917	3.88	5,471,379	9.53	6,230,180	2.83	4,275,064	6.79	65.7	+27.9
American Rolling Mill Co.	2,740,098				1,547,784				+77.0	
Wheeling Steel Corp.	839,659	.68	2,835,307	2.59	1,873,355	2.50	6,567,551	9.10	55.2	56.8
Keystone Steel & Wire Co.	191,576	.25	7,327,350		352,414	.47			45.7	
Pittsburgh Steel Co.	502,986	.56	1,880,160	2.42	687,536	.92	2,366,395	3.37	26.9	20.6
Rustless Iron & Steel Corp.			1,887,425	1.96	545,750	....	1,710,200	1.77	....	+10.3
Allegheny Ludlum Steel Corp.	904,370	.68			259,153	....			+248.9	
Alan Wood Steel Co.	130,190	.65	519,044	2.59	....	....	791,213	3.95	.....	34.4
Wickwire Spencer Steel Co.	.....	....	1,330,147	2.90	.....	....	1,011,315	2.20	.....	+31.5

All figures shown are reported after deductions either for taxes, back wage payments, provisions for debt retirement, contingencies arising from peak employment expectancy, or other causes.

stock after deduction of dividend requirements on the 5 per cent preferred stock. In the corresponding 1941 period, net profit was $321,138 or $1.03 a share on the common stock.

In the quarter ended Sept. 30, net profit was $100,895 or 31c. a share on the common stock, compares with $70,668 or 18c. a share in the quarter ended June 30.

•

• • • **Blaw-Knox Co.** reports profit of $711,179, subject to annual audit and year-end adjustments, for the nine months ending Sept. 30, and profit in the third quarter of $309,496 before charges of $183,751 applicable to the first six months of the year. The profit for the nine months is after provision for federal income and excess profits taxes. The nine month profit compares with a profit of $1,282,067 for the first nine months of 1941 after giving effect to year-end adjustments.

•

J. & L. Reports Earnings; Taxes Cut '42 Profits

Pittsburgh

• • • **Jones & Laughlin** Steel Corp. announced net profits for the first nine months of 1942 of $7,470,186 after providing $17-million for federal income and excess profits taxes. The nine months' income is equal to about $5.98 a common share. This compares with the $12,040,384 earned after $9,031,475 tax provisions in the 1941 period or about $9.60 a share. Common share earnings were computated after deduction for preferred dividends.

For the third quarter of 1942, the net profit was $2,539,716 or about $2 a common share after federal tax provisions compared with $3,942,157 or approximately $3 a share in the third quarter of 1941.

Provisions for taxes were made on the basis of the 1942 Revenue Act but without application of the 10 per cent post-war credit, which will be determined at the close of the year. Provisions were made for the 5½c. pay increase, retroactive to Feb. 15 which is anticipated in a forthcoming WLB ruling.

•

• • • **The board of directors** of Jones & Laughlin Steel Corp. at its meeting last week declared the stated dividend of $1.25 per share on its new 5 per cent cumulative preferred stocks, series A and B, to holders of record at the close of business Dec. 7, payable Jan. 1, 1943. The board also declared a dividend of 50c. a share on its new common stock to holders of record at the close of business Dec. 7, payable Jan. 6, 1943.

•

• • • **Wickshire Spencer Steel Co.** reported a net income after provisions for taxes, for the nine months ended Sept. 30, of $1,330,-147 or $2.90 a common share as compared with $1,011,315 or $2.20 a common share for the corresponding period of last year.

October Plate Shipments Increase to 1,124,118 Tons

Washington

• • • **Totaling 1,101,382 tons,** steel plate shipments in October were the next largest of the year, being exceeded only by July shipments of 1,124,118 tons. Of the October shipments 536,981 tons were produced on converted strip mills, 449,895 tons on sheared plate mills and 114,506 tons on universal plate mills. WPB Iron and Steel Branch Chief H. G. Batcheller said that approximately 80 per cent of this tonnage was for direct use by the Army, Navy and Maritime Commission with the remainder being for export and essential civilian needs.

Total shipments of plates during the first 10 months of the year have reached 9,736,000 net tons, which compares with shipments of approximately 6,000,000 net tons during the entire 12 months of 1941. Mr. Batcheller said that plate production is being scheduled for November and December at approximately the same level as October, but that increased production is anticipated for January.

Shipments of steel plates by months during the current year have been as follows:

	Net Tons
January	754,522
February	758,723
March	878,726
April	895,971
May	1,012,194
June	1,050,962
July	1,124,118
August	1,097,866
September	1,061,836
October	1,101,382
Total	9,736,300

WPB Schedules Output Of Construction Equipment

Washington

• • • **Effective** Nov. 15, the construction equipment industry, placed under allocation control on Monday, will operate on WPB-determined production schedules. Allocation control was applied with the issuance of Order L-192. The order stopped production for civilian use of 48 items of construction equipment, covered in Schedule C, which will be manufactured hereafter only for use of the military. This schedule includes such items as conveyors, derricks, drilling machines, rollers and scrapers.

There are two other schedules in the order—A and B. Schedule A comprises a list of various types of new machinery and equipment that after Nov. 15 may be bought, rented and sold by individual contractors and construction companies or other persons for their own account under WPB authorization. Items which appear in both Schedule A and C, however, may not be ordered, sold or delivered for civilian use nor will an authorization be approved. Schedule B contains a list of smaller, less critical units of equipment and machinery such as jack hammers, rock drills, material handling machinery, etc. Items in this schedule were removed from the restrictions that apply to all other types of equipment and machinery, in two respects: (1) the procedure for placing and receiving orders and (2) restriction on resale, rental and use, many of which may be classified as "off the shelf" equipment. Prospective buyers of Schedule A equipment when not acting for the government must obtain WPB authorization, using Form PD-556.

A vertical integration of the industry from top to bottom under a system of production quotas will supplant the limitation orders at present in force. Order L-192 supersedes Orders L-82 and L-82-a.

Factory output will be controlled by direct allocation of the finished units to authorized users, chiefly the war procurement agencies within the government and their contractors and agents. Regulations previously imposed under L-196 to require registration of used construction equipment and reports of change of status are retained unchanged.

•

WPB Will Revise Its Industry Branches

• • • **Reorganization** of industry branches of the War Production Board, giving them greater strength, is being undertaken now by the office of program determination under the direction of Ferdinand Eberstadt, vice chairman of WPB, and Ernest Kanzler, Director General for Operations.

One of the major reasons for strengthening branches is to enable them to handle the additional burdens to be placed on them by the new Controlled Materials plan, announced Nov. 2.

The new Controlled Materials Plan is outlined in detail in the Washington column starting on page 74 of this issue and continuing on pages 129G and 129H.

To as great an extent as possible, each industry branch will follow a similar pattern. Many of the functions of the office of the Director General for Operations, not including the Bureau of Priorities Control, will be decentralized and assigned to branches, making them responsible for all operating phases such as the execution of programs, policies and procedures established for the resources assigned to branches. Branches will not however, be responsible for policy, planning, coordination and supervision phases.

Permanent connection with industry will be maintained through active Industry Advisory Committees assigned to each branch. Claimant agencies—Army, Navy, Maritime Commission, Office of Civilian Supply, Lend-Lease, etc.—will assign permanent representatives to each branch. Permanent connection with labor also will be maintained through representatives assigned to each branch.

The pattern will apply to all material, product, facility or industry branches, although the detailed composition will depend on the individual branch.

Industry Advisory Committees assigned to the branch will endeavor to put upon industry a greater measure of responsibility for meeting war production problems. They will get advice from the industry on methods of increasing supply where shortages exist, of controlling the distribution of resources and of eliminating non-essential uses of resources. Likewise, they will obtain data on available and anticipated supply of resources and requirements for civilian use and for maintenance, repair and spare parts.

Resources, in this sense, include raw and industrial materials, processing and production capacities, facilities, tools, power and other items necessary to the production of end products, with the exception of manpower.

Representatives of governmental claimants in the industry branch will submit data on requirements for resources and advise and assist in apportioning the available supply in accordance with the determinations of the Requirements, Program Adjustment and Facilities Committees. Claimants, in addition will assist in the processing of various forms controlling the distribution of resources.

•

Boiler Output Hit

• • • **Production of** low pressure cast iron boilers built to use exclusively oil or exclusively gas for fuel was prohibited Nov. 7. Production of other cast iron boilers is prohibited unless they are used for essential purposes. The Nov. 7 order, L-187, defines a low pressure cast iron boiler as one designed for hot water or steam heating operated at a maximum working pressure of 15 lb. per square inch for steam, or 30 lb. per square inch for water. Boilers not using exclusively oil or exclusively gas for fuel can be produced only for specified military purposes, or for use in hospitals. Both of these permitted uses are subject to authorization on PD-704.

•

Shipments under PRP

• • • **Metal producers** and other suppliers of material to PRP units are being notified by Ernest C. Kanzler, Director General for Operations, that WPB approval of shipments of materials to be used by the purchaser in the manufacture of articles ordinarily sold

from stock will be granted if they contain PRP certificate serial numbers, in place of the Army and Navy contract numbers formerly required. Mr. Kanzler pointed out that the new procedure, effective immediately, permits suppliers of companies under PRP to accept orders for materials to be incorporated in stock items, without the inconvenience and delay frequently involved in securing armed service contract numbers. At the same time, PRP units are being instructed to furnish contract numbers whenever possible, and always in the case of purchases of material to be used in the manufacture of articles specifically on order. The action announced today does not apply in such cases.

•

Razor Blades Controlled

• • • **Razors** and razor blades were put under tighter production and distribution restrictions Nov. 4 with issuance of Order L-72, as amended. The amended order makes these provisions:

Safety razors can be produced only for the military forces, for export and for lend-lease purposes. None will be manufactured for civilian use.

Razor blades are allocated for the armed forces, export and lend-lease, and for civilians. Production of blades next year will be 12 per cent greater than 1940 output and 20 per cent less than 1941 output. (1941 was a record-breaking year, with over three billion blades produced. Next year blade production will approximate 2,750,000,000.)

It is anticipated that the supply of blades for civilian use will be ample to meet all requirements in 1943. While fewer blades will be made for consumer use, it was pointed out that the millions of men in the armed forces will result in a substantial decrease in civilian demand for blades.

•

Power, Steam Equipment

Washington

• • • **Procedures for** the production scheduling of heavy power and steam equipment are established in Amendment No. 4 to Order L-117, issued Nov. 2 by WPB. Manufacturers of power equipment will submit monthly reports covering existing production schedules. These schedules will be reviewed and, if necessary, revised by WPB.

Production scheduling has been devised as a means of reconciling the heavy demand for power equipment with the limited production facilities of the industry. Production schedules must be so arranged as to assure delivery of large items of equipment produced in separate manufacturing plants, it is important to integrate the delivery dates of such items.

The new amendment extends to a variety of power equipment controls including large steam generating boilers, steam surface condensers, steam engine generator units, frequency changers, synchronous condensers and transformers.

•

Aircraft Aided on Machines

• • • **Machine tool makers** have been instructed to give special emphasis to aircraft requirements by Amendment 3 to Order E-1-b, issued Nov. 5. The amendment increases deliveries to the air services, their prime and sub-contractors and other companies serving the air branches.

•

Auto Branch Given More Power

• • • **The processing unit** of the Tank and Combat Vehicle Section, and the Ordnance Priorities Unit, now are under the control of the Automotive Branch of the WPB. The Technical Service Branch has been discontinued. Also assigned to the Automotive Branch is the processing of PD-25-a and PD-25-f applications for ordnance production requirements.

•

Code Abandoned

Washington

• • • **Because WPB** believes that the Controlled Materials Plan when in effect will obviate the use of the Production Code, formerly known as the Allocation Classification, Priorities Regulation No. 10 was revoked last Friday. A further reason for the Production Code's abandonment is said to be that WPB believes that with the rejuvenation of PRP, the requirement of complying with the regulation would put an unnecessary burden of paper work on industry.

The Iron and Steel Branch pointed out, however, that the end-use information requirements of Order M-17 and orders in the M-21 series remain manatory and are not affected by the revocation. Likewise, WPB's Copper Branch will continue to require end-use information from brass mills, copper wire mills and copper foundries before making allocations.

•

Radio Parts Ruling

• • • **Radio makers** may supply replacement parts for home receiving sets under conditions set forth in Interpretation No. 1 of General Limitation Order L-183 issued Nov. 7.

•

Copper Control Continues

• • • **Continuation of** the strict control placed upon the use of copper in the manufacture of farm tractors and farm engine power units was announced Nov. 7 with the issuance of Supplementary Limitation Order L-170-a. At the same time, Order L-26-c, which formerly contained these controls, was revoked.

•

Action on Molybdenum

• • • **Permission** to deliver small amounts of molybdenum without applying for an allocation under Order M-110 was formalized Nov. 6 by Supplementary Order M-110-a. Permission was originally given in letter sent to producers and melters of molybdenum by Ernest Kanzler on Oct. 16.

Under certain conditions, deliveries up to 500 lb. of contained molybdenum may be made in any one month without applying for an allocation. Melters, other than large producers of iron and steel products, may use up to 500 lb. monthly without submitting melting schedules to WPB.

•

Laboratories Aided

• • • **Research laboratories** may secure a continuing supply of reagent chemicals, laboratory equipment and other materials by the revision of Order P-43 and the issuance of a new order, P-135. Order P-43, as revised, now is expanded to cover qualified production control as well as research laboratories, and assigns to all laboratories holding a serial number under P-43, a rating of AA-2X for the purchase of equipment, reagent chemicals, and other materials. For material costing more

than $50 except reagent chemicals specific authorization by the WPB is required to apply the rating. Such authorization is to be applied for on Form PD-620, and all holders of serial numbers must file Form PD-93 by the 15th of each month.

Order P-135 enables laboratories not holding serial numbers under P-43 to use a rating of AA-2X for chemicals used for analytical, testing, control, educational or research purposes. The rating assigned by P-135 may be applied without prior granting of a serial number as under P-43. The AA-2X assigned under P-135 must not be applied to material used in manufacturing operations, other than reagents.

•

Tin Order Interpreted

• • • **An official** interpretation of the Tin Conservation Order, M-43-a, was issued Nov. 7 to make clear that radio and radar equipment, when it is for the account of the armed services, and where the use of tin is required by specifications, is exempt from the restrictive provisions of the order.

•

Equipment Defined

• • • **"Domestic** laundry equipment" means washing machines and ironing machines of the type designed and built for home use, according to Interpretation No. 1 of General Limitation Order L-6, issued Nov. 7.

•

PRP Units Assisted; May Extend AAA Ratings

Washington

• • • **Firms operating** under PRP now may extend AAA ratings, which they receive on customers' purchase orders, to Priorities Regulation No. 11, as amended. Permission to this end was granted by WPB last week by Amendment No. 1 to the regulation.

The amendment, effective Nov. 2, lays down the conditions under which a PRP unit may extend an AAA rating. These conditions are:

1. An AAA rating may be extended when necessary to obtain material which the PRP unit will deliver, or which it will physically incorporate into material to be delivered, on the AAA rating;

2. The AAA rating may be extended only to obtain the quantities of materials required to fill AAA-rated orders;

3. The rating may not be extended to obtain any material which a PRP unit has on hand, or to replace inventory;

4. The quantity of any material obtained with assistance of the AAA rating must, so far as possible, be deducted from the quantity authorized on the unit's PRP certificate.

In case it is necessary to extend the rating to materials other than those authorized on a PRP certificate, or in larger quantities, a PD-25F form must be filed within three days after the extension, reporting the additional quantities or materials to which the AAA rating was extended.

•

Phenolic Resins Order

• • • **Phenolic resins and phenolic** resin moulding compounds will be put under complete allocation and use control, effective Dec. 1, by Order M-246, issued Nov. 4. The order bars delivery or use of phenolic resins or phenolic resin moulding compounds without specific authorization by WPB. Certain exceptions to these restrictions are made, including orders under 55 gal. per month.

Persons seeking resins and compounds for use in certain end-products (such as plywood, protective coatings, laminates, moulded products, and the items on List A of the Order) are required to file certificates with their suppliers specifying end-use in considerable detail.

The standard chemical allocation forms, PD-600 and PD-601 are to be used in applying for authorization to sell, deliver, accept delivery of and use.

•

Terneplate Uses Cut

Washington

• • • **Use of** terneplate containers after Nov. 30 for packing varnish removers, liquid lacquers, lacquer thinners, lacquer stains and shellac has been prohibited by WPB. Containers for these products, after Nov. 30, will be made of substitute materials such as glass or fibers. Effective on Nov. 4, amendment No. 5 to Order M-81 also provides that terneplate used for packing these products this year cannot exceed 90 per cent of the consumption in 1940.

In addition, the amendment prohibits packing of edible liquid oils in tinplate or terneplate containers of less than five-gal. capacity. For November and December the quota for terneplate and tinplate for such containers is established at 10 per cent of the total 1940 consumption for smaller containers of five-gal. and higher capacity.

Packing of varnishes and drying oils in blackplate metal containers after Nov. 30 was prohibited Nov. 2 in Amendment No. 2 to M-136. At the same time, the action requires that beginning Dec. 15, oil paints, oleoresinous paints and resin-emulsion water paints be packed in 1-gal. fiber-bodied containers, with only the ends of blackplate. This requirement expires on Dec. 31, but will be superseded by new restrictions on that date.

The same provision applies to pigmented lacquers, which come under the order for the first time. Until Dec. 15, this product may be packed in 1-gal. blackplate containers. The amendment also cuts use of blackplate for packaging all of the above products 10 per cent, reducing the total allocation for 1942 for these products to 90 per cent of the 1940 pack.

Blackplate quotas for baking powder containers, previously set at 25 per cent of the 1941 pack, are continued to Dec. 31 by the amendment.

•

L Order on Wire Cloth

Washington

• • • **Order L-209** limiting the number of wire cloths that can be held in inventory for use on a single paper mill machine unit was announced Nov. 2 by WPB. The wire cloths affected by the order are those fabricated from copper, nickel, chrome and alloys of these metals. Wire cloth is used in the manufacture of pulp, paper and paperboard.

The order prohibits any pulp or paper mill from accepting delivery of machine cloths for fourdrinier or other paper mill machine units, if such delivery would increase the inventory of wire cloths held in stock for a machine unit above the number permitted

by an attached schedule. It also requires that all purchase orders from pulp and paper mills must specify delivery dates and that no mill shall name a delivery date earlier than it may reasonably expect to be able to accept delivery without violating the inventory limitation.

•

Applications Speeded

Ottawa, Canada

• • • **Department of** Munitions and Supply announced that the clearance of Canadian applications for certain preference ratings on purchases in the United States of materials costing less than $500 in U. S. currency, has been accelerated by the delegation of limited authority to the Washington priorities representative in Ottawa. He has been given the power to issue individual preference ratings on PD-1A certificates to Canadian applicants.

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New List of Vital Materials Announced

• • • **The sixth** Material Substitution and Supply List, prepared by the Conservation and Substitution Branch of the Conservation Division of WPB, was issued Nov. 6. The fifth list was published on Aug. 21.

The list contains over 500 materials, arranged in the following three groups, ranked on the basis of their necessity and availability:

Group I—Materials which are vital to war needs and supplies of which are inadequate.

Group II—Materials which are also essential to war needs but supplies of which are currently in approximate balance with immediate demands.

Group III—Materials which are used to some extent in the war effort, which are available in quantities exceeding demand and which are recommended as substitutes for scarcer materials.

Metals in Group I are listed below. The secondary and scrap metals are each classified with the corresponding primary metal; in any given case the highest grades are the most critical and the secondary grades less critical. The order of listing has significance only in the case of metals.

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Stainless Steel Items Added to Order M-126

• • • **Use of** stainless steel in more than 75 products, ranging from coffee pots and cutlery to farm machinery and hot water heaters will be prohibited under the terms of a revised iron and steel conservation order (M-126) announced Nov. 5.

Effective immediately, delivery of stainless steel for products on a new List S is prohibited. For a period of 30 days, beginning today, manufacturers may use, out of inventories, up to 50 per cent of the average monthly stainless steel consumption for such products in 1941.

Complete stoppage of stainless steel use for the products on List S is effective at the end of the 30-day period, except that assembly is permitted for an additional 15 days.

At the same time, the revised order adds about 100 items to List A, which prohibits delivery of iron and steel, effective immediately, and prohibits the manufacture of the listed items with any type of iron and steel after 30 days, and assembly after 60 days.

During the 30-day period, manufacturers of products added to List A by the revised order may use, out of inventories, up to 75 per cent of the average monthly iron and steel used for such products in 1941.

Where Army - Navy - Maritime Commission orders are not given specific exemption by the inclusion of a List A or List S product on List C as well, the restrictive provisions relating to the new items will not apply for 60 days beyond the governing date.

Stainless steel may continue to be used to make items on List C for Army-Navy-Maritime Commission orders until Dec. 31. After that date, use of stainless steels for List C products is prohibited, except where expressly permitted for an item.

An additional exemption for stainless steel use for List C items after Dec. 31 is provided to take care of instances where other materials cannot be obtained readily.

A partial list of the new items on List A (barring the use of all iron and steel) follows:

Miniature toy banks.
Steam baths.
Bicycle racks.
Linoleum binding.
Sounding boards.
Boat hooks.
Boot jacks.
Meter boxes and covers, except industrial.
Buckles for clothing, except overalls and dungarees.
Buttons for work clothing.
Closers for paper and cellophane bags of less than 25-lb. content.
Car washing machines.
Cigarette package holders.
Hand cigarette making machines.
Hair clamps, barrettes, decorative clips and fasteners but not including common bob and hair pins.
Manhole covers.
Crutches.
Reinforced culverts, with certain exceptions.
Beauty parlor and home use curlers, curling irons.
Diaper receptacles.
Furniture and linoleum edging.
Fan stands.
Window and roller type shades.
All types of skewers.
Certain industrial machinery.
Spools for cord, ribbon, and tape.
Carpet stretchers.
Tent frames and supports.
Sewing thimbles.
Shutter-type ventilators.
Household water softeners and stills.
Finger nail files.
First aid kits.
Flag holders.
Fence gates.
Grave markers.
Outdoor grills.
Wire holders.
Tool houses.
Hog houses.
Poultry houses, except wire netting.
Humidification devices, except industrial and hospital use.
Ice cream molders.
Picnic jugs.
Step ladders.
All types of lawn and landscaping equipment.
Lunch boxes.
Meat molds.
Metal cloths.
Motion picture cameras, projectors and screen stands (except repair and maintenance).
Oil well pumping units with certain exception.
Partition studs.
Tent pegs.
Pencil holders.
Photograph equipment, except for microfilm.
Slides, loops and slide loops for work clothing.
Wire spools.
Tank towers under 50 feet in height.
Certain textile machinery.
Traffic land markers.
Electric vibrators.
Window shade rollers.

Among the items on the new

GROUP I

A. METALS

List (a)	*List (b)*	*List (c)*	*List (d)*	*List (e)*
*Magnesium	*Tantalum	*Molybdenum	*Chrome-Nickel Stainless Steel	*Steel Products*
*Aluminum	Beryllium	*Nickel	*Tool Steel	*Bars
*Copper	Rhodium	*Vanadium	*Straight Chrome Stainless Steel	*Forgings
*Tin	Lithium	*Tungsten	SAE Alloy Steel	*Seamless Tubing
*Bronze	Iridium	Cobalt	NE Alloy Steel	Plates
*Brass		Chromium	Low Phosphorous Pig Iron	Wire Rope
Cadmium		Calcium	Alloy Cast Iron	Wire Products
Zinc		Silicon	Wrought Iron	Castings
(Steel: Plain Carbon—II)				Structural
				Piling
				Tinplate

*Most critical.

This Week's Priorities and Prices

New steel drum containers and parts in the hands of manufacturers were put under complete allocation control under Order M-255, effective Nov. 16. (WPB-2100)

Substandard ferromanganese prices were established in Order 115 under Section 3(b) of the General Maximum Price Regulation, effective Nov. 3. These prices are for those who did not sell it during March. (OPA-T-251)

Chrome ore prices are established in Maximum Price Regulation No. 258, effective Nov. 9. (OPA-1051)

Copper base alloy screening prices to be paid by Metals Reserve Co. are established in Order 5 under Maximum Price Regulation 204, effective as of Oct. 19. (OPA-T-264)

Cadmium prices to be paid by Metals Reserve Co. for its war stock pile are established in Order No. 6 under Maximum Price Regulation No. 204, (OPA-T-265)

Use of stainless steel in more than 75 products ranging from coffee pots and cutlery to farm machinery and hot water heaters, is prohibited under order M-126 as amended Nov. 5. (WPB-2103)

Scrap dealers' yards and automobile graveyards are aided in securing necessary repair and maintenance material by order P-136 issued Nov. 6. (T-1166)

Allocation Classification System, set up in Priorities Regulation No. 10, has been revoked. (T-1162)

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For copies of above announcements address Office of War Information Washington, giving announcement number as shown in parentheses after each paragraph. (For example, **WPB-600** *means announcement 600 issued by the War Production Board.)*

Revisions to The Iron Age Priorities Guide

• • • The following data, together with all intermediate weekly revisions in THE IRON AGE, should be added to THE IRON AGE Priorities Guide published with the issue of October 8 to bring the Guide up to date.

"Priority Regulations":

No. 10...Revoked (11-5-42).

No. 11...Amendment No. 1 (11-3-42) permits firms operating under PRP to extend AAA ratings which they receive on customers' purchase orders.

"M" Orders:

M-27...Amended order extends allocation of phenol to include certain substituted phenols and phenol-bearing materials (11-3-42).

M-43-a...Interpretation makes clear that radio and radar equipment for military use is exempted from restrictions of order (11-7-42).

M-50...Amended order provides that no jewel bearings will find their way into any but essential war work (11-3-42).

M-81...Amendment No. 5 (11-3-42) prohibits use of terneplate containers for packing varnish removers after Nov. 30.

M-110-a...Supplementary order gives permission to deliver small amounts of molybdenum without applying for an allocation under order M-110 (11-6-42).

M-126...Amended order prohibits delivery of stainless steel for products on a new List S (11-4-42).

M-136...Amendment No. 2 (11-3-42) prohibits packing of varnishes and drying oils in blackplate metal containers after Nov. 30.

M-162...Amendment (11-2-42) prohibits use of platinum in all jewelry manufacture.

M-246...Order places phenolic resins and phenolic resin molding compounds under complete allocation and control (11-4-42).

M-255...Puts new steel drum containers and parts in the hands of manufacturers under complete allocation control (11-3-42).

"P" Orders:

P-43...Revised order is expanded to cover qualified production control and assigns all laboratories holding a serial number a rating of AA-2X for the purchase of equipment, etc. (11-7-42).

P-135...Order allows laboratories not holding serial numbers under P-43 to use a rating of AA-2X for chemicals.

P-136...Order gives high priority rating for repair and maintenance material to scrap dealers' yards and automobile graveyards (11-6-42).

"E" Orders:

E-1-b...Amendment No. 3 (11-6-42) gives higher preference rating on machine tools to manufacturers of aircraft.

"L" Orders:

L-30-a...Places galvanized ware under simplification and curtailment restrictions (11-7-42).

L-41...Interpretation of construction limitations in order is that repair will be considered on the basis of utility (11-4-42).

L-72...Amended order puts razors and razor blades under tighter control (11-3-42).

L-117...Amendment No. 4 (11-2-42) establishes control over surface condensers.

L-170-a...Order allows relaxation of restrictions on use of copper and copper base alloy in replacement parts for farm tractor and farm engine power units (11-7-42).

L-172...Amendment No. 1 (11-3-42) removes surface condensers from order.

L-183...Interpretation No. 1 (11-7-42) permits radio manufacturers to supply replacement parts for home receiving sets under certain conditions.

L-187...Order prohibits production of low pressure cast iron boilers built to use exclusively oil or gas for fuel (11-7-42).

L-209...Order limits number of wire cloths that can be held in inventory for use on a single paper mill machine unit (11-3-42).

List S (stainless steel prohibited) are:

Ice cream cabinets.
Ammunition boxes and chutes.
Coffee pots.
Branding and labeling devices.
Processing and bottling equipment for alcoholic and non-alcoholic beverages.
Cutlery.
Dishes, saucers and plates.
Fountains.
Kitchen and restaurant paneling.
Iceboxes.
Lavatory equipment.
Light fixtures.
Base clamps.
Fans, except industrial.
Name plates.
Radio antenna.
Washing tubs.
Shelves.
Window screens and frames.
Cheese vats.
Fishing tackle and equipment.
Furniture hardware.
Badges.
Boiler casings.
Cable terminals.
Clocks, clock-dials and cases.
Central levees.
Lanterns and lamps.

•

Containers under Control

Washington

• • • New steel drum containers and parts in the hands of manufacturers were put under complete allocation control Nov. 3. Sheet steel allotted for the manufacture of steel drums has been found insufficient to satisfy all outstanding orders rated AA-1 or higher, making it necessary to exercise tighter control over sale and delivery of the containers.

The order, M-255, prohibits manufacturers from selling or delivering new steel drums and parts (excepting flanges, plugs and cap seals) after Nov. 16, without specific authorization of the WPB Director General for Operations. Likewise, persons manufacturing drums for their own use are prohibited from using any drums which were not completely manufactured before Nov. 16, unless they have similar authorization.

Steel drum containers, used for packing such products as oil and gasoline, are essential for shipment of supplies to the armed forces and for other purposes connected with the war program. An earlier order, L-197, established restrictions over the use of both new and second-hand drums, and listed products which could not be packed in steel drums. The action prohibits the use of new drums for packing permitted products without authorization.

Authorization must be applied for by addressing a letter in duplicate to the Containers Branch, War Production Board, Washington, D. C., marked Ref. M-255. The letter should have a copy of the purchase order attached and should state what the drums are to be used for, what products are to be shipped in them, where they are to be shipped, and the use to which their contents are to be put.

Washington . . .

Details of New Controlled Materials Plan

(*Continued from Page* 76)

dustry branches. The list is intended to include certain specified types of intermediate products or component parts which may be included in either Class A or other Class B products. For a specific list of civilian-type end products, reference should be made to the instructions to be furnished regarding types of bills of materials which manufacturers of each type and product within both Classes A and B are to be requested to provide.

PRIME consumers send detail and summary bills of material to the claimant agencies. The agencies send requirements for production, construction or facilities and maintenance and repair to the WPB Requirements Committee and the Controlled Materials Branches (steel, aluminum, copper). The Committee after conference with the branches and the agencies determines what amount of controlled materials the agencies should have for given purposes, in view of material supply and strategic demand.

The agencies, within predetermined programs, allot quantities of materials for a given time to prime consumers which in turn allot materials to subcontractors and suppliers. Prime consumers must apply for their own requirements for end products as well as those of their subcontractor and suppliers.

The bills of material which have to be gotten by claimant agencies have to be expressed in terms of steel, aluminum, copper and copper-base alloys, the controlled materials. Also, Exhibit I of the plan sets forth other materials which must be shown on the bills. These are: beryllium; cadmium; cobalt, other than as an alloying element; cordage fibers, manila, sisal, jute, istle; magnesium; mercury; mica, other than ground mica; monel—natural; nickel, other than as an alloying element; nylon; rayon—high tenacity; rubber, crude, liquid latex, reclaimed, synthetic; tin; tungsten, other than as an alloying element; wood; zinc.

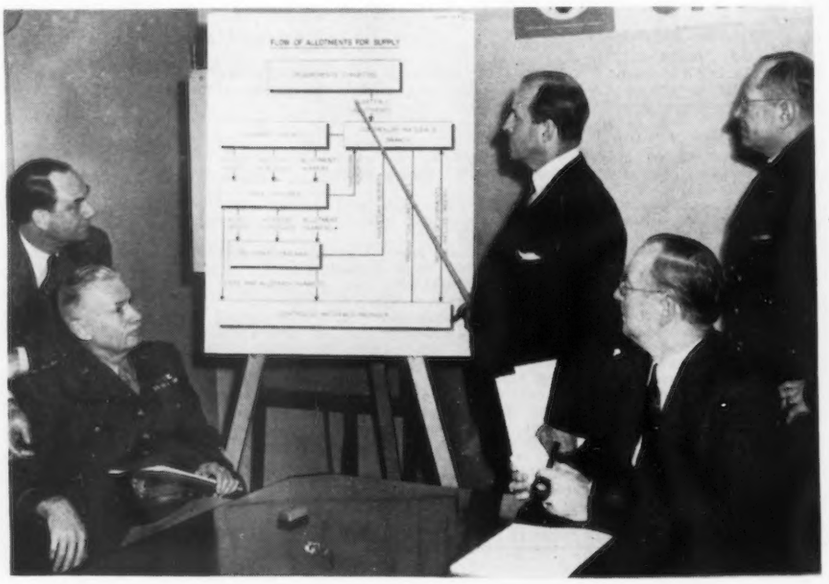
When identified on the bills of material the foregoing materials must be expressed according to the CMP Material Code number from the CMP materials list. The CMP materials list is a classification list of materials with a conversion table showing the translation from "Red Book" (the Army and Navy Munitions Board classification list) codes to CMP codes.

For highly repetitive items, certain claimant agencies and industry branches will have to get as rapidly as possible detail bills of material showing forms and sizes in greater detail than is required by Exhibit I of the plan and covering other materials than controlled materials. The bills of material on products made on a mass basis should be prepared with great accuracy but prototype bills are considered sufficient for products whose specifications represent slight variations. Engineering estimates will be accepted for non-repetitive items and in the case of construction estimated bills of materials and estimates of the total requirements of every agency will be sufficient.

The detail bills of material should be prepared from the engineering parts list and should show an analysis by CMP materials of each component part (excluding Government furnished equipment and Class B items) of the procurement item under the following headings: drawing or part number; part name; specification or chemical analysis of the material (not to be furnished unless specifically requested); CMP Material Code number and net weight of finished part; gross weight (including rejections and overage, etc.) of material required to make the part; number of parts; total net weight; total gross weight (including rejections, etc.).

The Summary Bill of Material is to show all of the materials going into a product purchased by the claimant agencies. The total amounts of each material shown on the CMP materials list required for a procurement item as follows: Controlled material list name; controlled materials list code number; total net weight, total gross weight, including rejections, etc.; lead time or lead times.

Lead time is the time interval expressed in months between the



Press Assoc. Inc. Photo

CONTROLLED MATERIALS PLAN: Ferdinand Eberstadt, vice chairman of WPB, standing before the chart, shows WPB, Army and Navy heads how the new Controlled Materials Plan will function. Left to right are: William L. Batt of WPB; Lieut. Gen. Brehon B. Somervell; Eberstadt; Donald M. Nelson, WPB chairman, and Rear Adm. H. L. Vickery.

required delivery of materials from the plant of the supplier of the listed materials and final acceptance or delivery of the procurement item, or in the case of Class B products, upon completion of their manufacture.

Bills of materials for Class A products are not to be submitted by prime consumers unless requested by the claimant agency. In the case of purchased parts or assemblies it will be necessary for the prime consumer to get from his secondary consumer the necessary information to complete the bill of materials.

Bills of material for Government furnished equipment and Class B products are the exception to the requirement of showing gross and net weight of the materials listed. In the case of both of these exceptions, the bill of materials is to list by name and part number (if available) the quantity or dollar value of each of these items required in the complete procurement item and is to show the time interval required between receipt of Class B items as such and final acceptance or delivery of the procurement items.

Requirement estimates for Class B products will be presented separately by claimant agencies and will be estimated as indicated by the foregoing. OCS has been given the responsibility of preparing estimated bills of material for these products or any other approved basis for determining requirements of controlled materials for Class B products, obtaining such information through the approved industry branches.

If requirements exceed the capacity of fabrication facilities, each agency shall revise its affected programs and schedules so that its requirements fall within its share of Class B products, as agreed or determined by Fredinand Eberstadt. Allotments are then to be issued by the industry branch. For selected classes of miscellaneous Class B products, OCS shall assume complete responsibility for the preparation of requirements and for allotments of controlled materials up to a fixed maximum dollar value for a specified period of time.

The presentation of summary bills of materials should not be delayed awaiting the accumulation of net weight information. Submission of this data may be deferred. Prime consumers of controlled materials must maintain on all bills of materials procurement items on a current basis at all times by submitting revisions indicating the effect of all engineering or specification changes which substantially alter the total quantity of any material required during a month.

The bill of material is to include all material on the CMP materials list incorporated in the finished product (except in parts on the excluded list) including for example material deposited in plating and packing when specified as an integral part of an item of procurement. Materials used indirectly in the manufacturing process should be omitted.

In reporting small purchased assemblies which consume relatively small quantities of the listed materials, prototype bills of material are acceptable. All materials are to be reported in terms of the unit of measure indicated on the CMP materials list, and when specifications or chemical analyses are required, standard specifications such as "SAE," "Army," "Navy," "Federal," "ASTM." In the absence of such recognized specifications, a manufacturer's specifications may be used.

On the detail bill of materials, the total net weight of parts is the net weight per part multiplied by the number of parts. It is the aggregate net weight of all parts identical with the one being reported which will be incorporated in the particular subdivision of the procurement item as listed.

On the summary bill of material the total net weight is the total net weight of a particular material contained in the complete procurement item. If the summary bill is subdivided by functional or other groups at the specific request of the claimant agency, then the total weight contained in the subdivision of the procurement items will be represented. The same general rules with respect to net weight are to be applied to gross weight where required to be shown on detail and summary bills of material.

WPB says it is imperative that summary bills of material be submitted by the consumer and detail bills may also be required. However, the prime consumer should not cause delay to the claimant agency while preparing detail bills. The preparation of these bills may be deferred.

Separate bills of material may be required for spare parts as a separate procurement item and on detail bills of material the component parts should be reported functionally according to trade custom and modified only to the degree necessary for adequate scheduling by the claimant agencies.

The detail bill of material is to include direct material for all purchased items except Class B products as well as those parts manufactured by the prime consumer. When reporting small purchased assemblies, excluding Class B products, which are not generally separated into individual parts by the purchaser, the analysis may, subject to the claimant agencies' approval, be made for the entire assembly without detail as to each individual part, except for individual pieces or subassemblies which may be furnished in spare part sets. Components of purchased assemblies should be listed in a group immediately following the name and part number of the assembly.

It may be necessary in some cases to make a quick engineering estimate of approximate material requirements by grouping without detail small items which require negligible amounts of material. In each instance where this procedure is used, a notation on the bill of materials should indicate the manner in which such material estimates were calculated. The summary bill of materials shall contain a separate list of Class B items incorporated in the procurement items being reported.

When the prime consumer gets his allotment number from the claimant agency which grants to him permission to get a certain amount of steel over a designated period, he may, unless otherwise instructed, place his order anywhere he pleases. However, each order, except for steel casting, must be accompanied by three copies of an authority to purchase steel.

Small quantities of controlled materials may be combined, into one purchase order without the listing of supporting allotment numbers, provided the quantities are supported by allotments properly made. No order so combined shall include any item supported by a single allotment number applicable to more than the following quantities: carbon steel, five tons; alloy steel, one ton; stainless steel, 500 lb.; copper, 200 lb.; aluminum, 100 lb. The same procedure may be followed by a purchaser of Class A or Class B products whose orders are based on numerous contracts or purchase orders received bearing allotment numbers authorizing him to allot similar small quantities of controlled materials to his secondary consumers.

George M. Verity, Steelmaster, Founder of

• • • **George Matthew Verity,** founder of the American Rolling Mill Co., died Friday, Nov. 6, at his home in Middletown, Ohio. He was 77 years of age.

Mr. Verity was internationally known and an outstanding figure in the American steel industry. He founded the American Rolling Mill Co. 50 years ago and at the time of his death was chairman of the board of that company, having been succeeded as president by his son-in-law, Charles R. Hook in 1930.

George M. Verity was born at East Liberty, Ohio, April 22, 1865, the son of an itinerant preacher. In 1886 he became manager of the W. C. Standish Wholesale Grocery Co. of Cincinnati. Three years later he became general manager of the Sagendorf Iron Roofing & Corrugating Co. in Cincinnati, which in 1891 was re-organized as the American Steel Roofing Co. of which he was made vice-president and manager. This led to his founding of the American Rolling Mill Co. in Middletown in 1899.

George M. Verity was more than an outstanding figure in our industry. He was an exemplification of the sterling characteristics that have provided the leadership to make American industry at its best.

There was a book, published last fall, entitled "True Steel." It is the life story of George M. Verity and it is a biography not only of the founder of the American Rolling Mill Co., but also of the American system of enterprise.

In paying our last respects to a departed friend as well as a great captain of industry, perhaps we can do no better than to quote what THE IRON AGE of Nov. 6, 1941, said about this book:

"It was the American System of Enterprise that made it possible for George M. Verity, and the associates he gathered around him, to do what they did. To start with no capital except brains and the willingness to work, with no tools except ideas and ideals, and from this combination build a steel business with total assets of more than $150 million and rated among the top eight in American industry. And to do this in the most fiercely competitive age that this country or any other has known.

"In these modern days, when Horatio Alger's books have gone out of fashion, and the idea seems to be to try to get the most for the least effort, when the exercise of initiative is being discouraged by precept and example, one may indeed wonder whether it will be possible in the future for industrial history to repeat itself. Whether it will be possible again for a boy with as little material advantages as this son of an itinerant preacher to build as this man and others like him have built.

"The industrial edifice of America has not been constructed upon a foundation of bricks and mortar, nor has our unequalled standard of living been, as some believe, machine made.

"For underlying every example of success in constructive enterprise and back of every improvement in process or machine has been the kind of leadership that can inspire men to enthusiastic cooperative endeavor. Leadership is the term for it. Leadership and not drivership. The sort of leadership that is willing to forget the hour of the day or the day of the week; to forego self interest in the cause of service and to forge steadily ahead toward the goal of more work for more men and more things for more people.

"But the environment must be right or leadership won't work. And if it does not work, then there will be no more poor boys who can grow into captains of industry and no more little manufacturing plants that can grow into big ones."

George M. Verity was a respected and honored figure in American industry, but not more honored and respected there than he was in his own steel industry and in his own steel company. No one could examine the 50-year record of Armco which is filled with continuous original achievement, leadership of individual and outstanding character, with pioneering and successful penetrations of many varied frontiers and fail to see that a great mind and spirit had been at work.

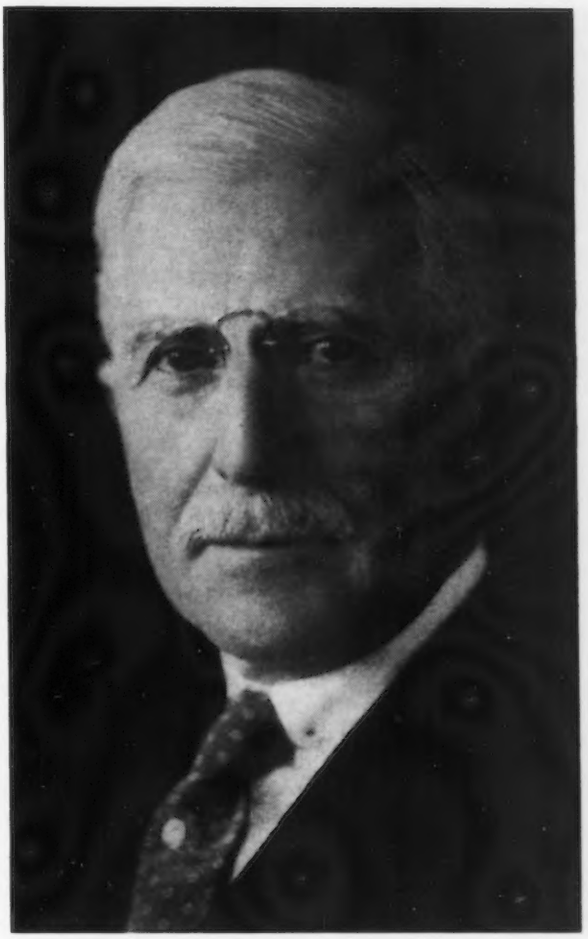
Because of his virility of mind and body, his keen interest in his fellow men and his enthusiasm for the task at hand, we who knew him always regarded Mr. Verity as a young man. And so he was, for until the last, years of experience and honors had not diminished his joy in doing. Yet Mr. Verity had a longer record of continuous service as a chief executive of a major steel company than any other man now living.

His admirable quality of persistence in ideals and effort, determination to stick to the ship no matter how bad the weather nor how enticing the port has done much for Middletown and the other communities of Armco.

Mr. Verity was a man who makes men. That is the greatest and most essential quality of leadership. He was a friendly man in the truest sense of the word, which denotes the desire to understand and to benefit his fellow men as well as to learn from them. That spirit of friendliness not only embraced his fellow workers, the stockholders and the customers of his company and his neighbors in the community, but it extended as well to his competitors. If proof of this were needed, it could be found in the signal honor conferred upon him in October, 1935, by the American Iron and Steel Institute when it elected him honorary vice-president because, in the words of the board of directors, "of their sincere appreciation of the devotion which Mr. Verity has shown to the interests of the Institute and of the steel industry as a whole, and the help and support which he has given so freely all the work of both the board and the executive committee."

Perhaps one of the greatest tributes to Mr. Verity's quality of leadership was derived from his unusual understanding of men and which enabled him to always surround himself with fellow workers who have been both able and eager to carry forward the torch of his ideals. Achievement of this sort is the ultimate in indus-

Armco, Dead at 77



YOUNG IN SPIRIT: George M. Verity, who died early this week at the age of 77, was one of the few remaining founders of companies comprising the modern steel industry. He had been a "young" steel man for 50 years.

trial organization in that it assures perpetuation.

George M. Verity would be the last to claim credit for the various achievements of the company that he founded. He would say that the engineers, the superintendents, the foremen or the workmen themselves were responsible for and should be credited with them. But if you ask these men, they will tell you that environment goes far in the matter of securing results; that not everywhere can a man with a new idea find encouragement and help from his superiors in developing it; that not every day can one find the kind of managerial courage that will refuse to be hampered by precedent; that not in many organizations will you find the red tape cut and the doors of advancement open to the man whose enterprise and initiative impels and urges him to better performance. Many men, indeed, have been responsible for the splendid record of Armco but each one of them will tell you that his own accomplishment was made possible, or at least made easier, by the spirit of Armco, which urged him to do the right thing and to do better things. That spirit had been instilled throughout the organization from its beginning by George M. Verity.

Under Mr. Verity's tutelage and with the enthusiastic cooperation of his well chosen assistants his company has become outstanding not merely in one phase of achievement, but in nearly every aspect of industrial and merchandising operations. In research, in production methods, in engineering, in merchandising as well as in safety and employee relations, this company has an exceptionally high performance record. But there was another phase and a more recent one of George M. Verity's activities in which the same quality of advanced leadership was splendidly displayed. This was the interpretation to the general public, of the ideals and principles which motivate honest American business and upright American industrialists.

In the past few years, business baiting has become a popular pastime. More or less, that has been the fault of business itself, not because of sins of commission but of the sin of omission. The sin of omitting to make friends with the great public; to interpret business to people; to develop mutual understanding. Industry has needed a voice, not of defense but of explanation, a kindly voice that could speak without rancor and tell in understandable and convincing terms of the great mutual interdependence of government, business, industry and the people.

In George M. Verity, business found that voice. During the past five years he has crusaded for mutual understanding. His masterly editorials and articles in newspapers have been read by millions of American citizens. The spirit of tongues descended upon this friendly steel master so that he might become an eloquent apostle of industrial peace.

When one reflects upon the great esteem in which George M. Verity was held by his entire industry you might wonder perhaps what the magical touchstone was that enabled him to do so much and be loved by so many. Great ability and determination? Yes, but they do not account for it all. A friendly man? Yes, but that is not enough. What is it? That answer may be found in Mr. Verity's own writings in THE IRON AGE. Here is an illuminating paragraph in an article from his pen which appeared in May 22, 1924:

"Anything we as a group can do to create good will for our industry through the adoption of practical ideas, of sound policies, of progressive methods and through the capitalization of our spiritual resources, will I feel create a factor of stability of enduring value."

There you have it—the capitalization of spiritual resources. And there is no man in industry who has brought to his daily task a richer store of spiritual resources than did George M. Verity.

PERSONALS . . .

• **Allen P. Livar** has been appointed chief engineer, Airtemp Division, Chrysler Corp. Mr. Livar has served Airtemp since 1937 as chief heating engineer and, in his new capacity, will take over the duties of **R. G. Wyld** who has accepted the commission of Lieutenant, Senior Grade, in the U. S. Navy. Before joining the Airtemp organization as chief heating engineer in 1937 Mr. Livar designed the Richvar radiator, produced by the Richmond Radiator Co. After graduation, he immediately joined the United States Navy with the rank of Ensign, and was assigned to engineering duty. Following World War I, he served the United States Steel Corporation as a machinist apprentice and later had charge of assembly of 3,000 h.p. marine engines for the Hardie Tynes Company of Birmingham, Ala. Mr. Livar then entered the heating industry with American Radiator Corporation in the company's Birmingham Plant, but was soon transferred to the Atlanta District Office where he led the southern division in sales from 1922-24. Later he served Pierce, Butler and Pierce as Branch Manager of their Newark, N. J. office.

• **M. L. Carson,** acting engineer-in-charge, has been appointed manager of the engine and condenser department of the Allis-Chalmers Mfg. Co., Milwaukee. Mr. Carson was made engineer-in-charge of this department in February of this year, having served as department correspondent and estimator for 20 years previous to this. He entered the Allis-Chalmers organization in 1916. **Forrest Nagler,** chief mechanical engineer, will be in charge of the Allis-Chalmers engineering and development department during the absence of Edwin H. Brown, engineering vice-president of the company, who was recently appointed assistant chief of iron and steel branch in charge of plant facilities section of WPB.

• **Lauson Stone** has resigned as assistant to the president of Jones & Laughlin Steel Corp., Pittsburgh, to become president of Follansbee Steel Corp., Pittsburgh. Mr. Stone was associated with Jones & Laughlin for 23 years and in his new position succeeds **W. T. Brownscombe** who has resigned because of ill health.

• **Harry W. Renick** has been appointed a vice-president of Brake Shoe & Castings Division of the American Brake Shoe & Foundry Co., New York. This is in addition to Mr. Renick's present duties as vice-president of Brake Shoe's Ramapo Ajax Division. In 1913 Mr. Renick became connected with the Elliot Frog & Switch Co., now a part of Ramapo Ajax, and three years later was sent to St. Louis as sales manager. In 1926 Mr. Renick was instrumental in opening Ramapo's first plant on the west coast at Los Angeles, for the manufacture of railroad frogs, switches, and special trackwork. He was placed in charge of this plant and later of a new plant at Seattle as well. When Ramapo Ajax became a Brake Shoe division Mr. Renick was made vice-president in charge of the division's western plants at Los Angeles, Seattle and Pueblo.

• **Lee J. Eastman,** president and general manager of Packard Motor Co. of New York, sales and service agency, has retired. He is replaced as president by **George T. Christopher,** president of the parent corporation, Packard Motor Car Co., Detroit, and as vice-president and general manager of the New York company by **R. W. Carson,** former assistant sales manager at Detroit. In connection with the changing of personnel the parent company moved to consolidate its export operations for the time by placing Mr. Carson at the active head of Packard Motors Export Corp. as vice-president and general manager. Here he replaced **G. R. Ford,** who has resigned to enter war work.

ALLEN P. LIVAR, chief engineer, Airtemp Division, Chrysler Corp., Detroit.

M. L. CARSON, manager, engine and condenser department, Allis-Chalmers Mfg. Co., Milwaukee.

LAUSON STONE, president, Follansbee Steel Corp., Pittsburgh.

GEORGE H. JOHNSON, whose appointment as director of the WPB tools division was announced in last week's issue of THE IRON AGE, p. 128.

• **Charles R. Foreman,** formerly in the metallurgical department of Oldsmobile at Lansing, Mich., has become a member of the metallurgical department of the Park Chemical Co., Detroit. **Earl H. Seelbach** has been appointed Park's representative for the sale of heat treating products and allied materials in the territory west of Syracuse to Buffalo, and including Ontario, Canada.

• **J. L. Townsend** has been appointed assistant manager of sales, fractional-horse-power motor section, of General Electric's Motor Division. Mr. Townsend joined General Electric as a student engineer at the Fort Wayne Works in 1925. Early in 1926, he was transferred to the fractional-hp motor sales department, and later that year to the same department in the company's Chicago office. During the period from 1926 to 1937 he was located in the Detroit and Grand Rapids offices. In 1937, he was reassigned to the fractional-hp motor sales section at Fort Wayne.

• **J. V. Burley,** manager of sales, Sheet & Strip Division, Republic Steel Corp., Cleveland, has been made general manager of sales of the Steel & Tubes Division. **John W. Carpenter,** assistant manager of sales, Sheet & Strip Division, since 1935, has been named acting manager of that division. Mr. Burley started in the steel business in 1917 when he joined the sales staff of the Midvale Steel & Ordnance Co., Detroit, which later merged with Bethlehem Steel Co. In 1925 he became associated with Trumbull Steel Co. in its Detroit office. Following Trumbull's inclusion in the merger forming Republic Steel Corp., he was successively in charge of Republic's Toledo office, assistant manager of the Sheet & Strip Sales Division at general headquarters, and later manager of that division.

• **R. W. Hull** has been appointed manager of sales of the Carbon Bar Division of Republic Steel Corp. Mr. Hull succeeds W. F. Vosmer, who has been in Washington for nearly a year with the War Production Board as manager of Hot Rolled Carbon Bars and Semi-Finished Units. Mr. Vosmer will return to Republic when his services in Washington are concluded.

• **Damon deB. Wack,** assistant to the president of National Bearing Metals Corp., St. Louis, has been elected executive vice-president of that company in active charge of all plants. Formerly vice-president of the Pacific Coast division of the parent corporation, American Brake Shoe & Foundry Co., Mr. Wack went to National from San Francisco about a year ago to assume the duties of assistant to the president.

• **Albert Bradley** and **O. E. Hunt** have been elected executive vice-presidents of the General Motors Corp. **E. F. Johnson,** vice-president in charge of the Dayton, Ohio, and Eastern Aircraft Divisions of the corporation, has been named a member of the War Administration Committee.

• **Edward S. Coe, Jr.,** who has been with the company since 1936, has been appointed manager of the New York office of Farrel-Birmingham Co., Inc., Ansonia, Conn., to succeed E. H. Thomas, who died recently. Following two years at the Buffalo plant on gear sales, Mr. Coe spent a brief period at the New York office and then over a year as sales engineer in the company's Chicago office. The next three years were spent at sales engineering at the company's main office in Ansonia. For the past few months he has been in charge of expediting production of Farrel-Sykes gear generating machines.

OBITUARY . . .

• **Earl Hauser McCarty,** former president of the Nash Motors Corp., died Nov. 2 at Delray Beach, Fla., of heart disease. He retired from Nash six years ago.

• **W. B. Weston,** formerly assistant to vice-president and general manager of sales of Carnegie-Illinois Steel Corp., Pittsburgh, died recently in Detroit. Mr. Weston had been associated with Carnegie since 1888, at which time he joined the company as an office boy in the St. Louis office. He had retired in 1937.

• **John W. Wilkins,** president and general manager of All-Steel Mfg. Co., Battle Creek, Mich., maker of paper balers and hose clamps, died Oct. 28.

• **John J. Daniels,** treasurer of the Divco Twin Truck Co., died recently. He had been associated with Divco for 16 years.

• **Julius Kahn,** inventor of the Kahn System of cement reinforcing and founder of Truscon Steel Co., died Wednesday, Nov. 4, at his home in Cleveland after a short illness. He was 68 years old. For many years, Mr. Kahn has been prominent in the steel industry and in the field of civil engineering. Until 1935, he was president of Truscon Steel Co., Youngstown, and when that firm merged with Republic Steel Corp., he became a director and vice-president of the latter firm. He retired from his post in 1939 to look after his own interests.

• **William Alexander MacFarland,** representative of the Abrasive Co. of Philadelphia, died recently in Detroit. Mr. MacFarland was a pioneer in the introduction of abrasive tool cutting to the automobile industry.

• **A. R. Robertson,** widely known in industrial and engineering circles in Canada and the United States, died in Toronto, Nov. 4, aged 54 years. He was Ontario Division manager of Dominion Bridge Co. Ltd. Throughout his business career he held many important offices, including that of president of McGregor-McIntyre Iron Works Ltd.; director, Dominion Engineering Co. Ltd.; vice-president, Sault Structural Steel Co. Ltd., and director of Toronto Lock Mfg. Co.

The Iron Age Critical Tool Locating Chart

• • •

Compiled from latest WPB data on available machine tool capacity.

CRITICAL TOOLS	REGIONAL OFFICES—WAR PRODUCTION BOARD											
	Total	No. 1 Boston	No. 2 New York	No. 3 Philadelphia	No. 4 Atlanta	No. 5 Cleveland	No. 6 Chicago	No. 7 Kansas City	No. 8 Dallas	No. 10 San Francisco	No. 11 Detroit	No. 12 Minneapolis
BORING												
Horizontal—3" Bar	52,038	7,263	12,262	5,801		10,443	6,522	1,332	1,705	1,807	3,878	1,025
" —To 4" Bar and Over	60,391	5,772	6,792	9,315		18,620	6,327	3,601	2,078	3,543	2,998	1,345
Vertical—54"	34,994	4,319	4,462	5,122		8,197	3,746	3,430	1,495	754	1,169	2,300
" —To 84"	51,834	4,254	6,109	8,196		14,115	4,939	3,727	3,980	3,656	1,257	1,601
" —To 120"	17,672	1,795	2,812	2,276		5,473	1,752	1,411	465	608	700	380
" —Over 120"	5,929		1,404	1,284		1,785	905	346	37			168
Jig Borers	32,088	8,117	6,620	2,835		5,101	4,212	931	274	746	3,139	113
Misc. Precision—Heald—Ex-Cell-O type	21,810	1,663	1,045	1,856		8,976	4,166	1,422	238	1,412	684	348
BROACHING	72,014	15,244	9,263	4,524		16,704	11,542	3,439	1,326	2,208	5,939	1,825
DRILLING												
Radial 6' to 8' Radius	76,624	7,254	13,900	12,034		22,201	7,731	4,997	3,262	664	3,055	1,526
Over 8' Radius	3,824	138	853	1,186		292	96	120	1,007		72	60
DUPLICATING AND PROFILING	30,680	10,895	6,570	3,855		3,985	3,454	467		384	932	138
FORGING												
Drop—Hammer—Board 100 lb. up	127,990	40,041	41,238	9,656		22,725	10,120	1,184	762	1,232	108	924
Steam 5000 lb. up	12,546	2,447	1,077	595		2,801	703			172	4,383	368
Press—Forging—Steam Hydr. 500 ton	8,349	1,016	3,438	176		2,275	1,366			68	10	
GEAR CUTTING												
Gear Hobbers—48" and up	23,868	2,284	1,169	3,367		7,243	3,266	1,868	901	1,594	1,342	834
Bevel Gear Cutters	52,068	11,105	4,799	7,515		13,956	8,343	1,864	766	828	2,624	268
GRINDERS												
Centerless	37,461	8,092	4,591	3,322		7,659	4,425	2,339	172	1,147	5,330	384
External Cyl.	409,196	98,466	73,305	38,798		62,536	50,880	23,776	4,338	12,455	30,850	13,792
Internal Cyl.	138,624	27,351	16,317	12,346		22,975	19,949	12,620	5,338	6,308	11,597	3,823
Thread	4,232	929	1,261	676		632	350		168		132	84
LATHES												
Engine—24" Dia.—Over 60" c.-c.	224,246	33,933	37,180	29,568		49,423	22,432	14,101	15,306	6,181	7,443	8,679
" —Over 24" Dia.—To 60" c.-c.	91,323	14,830	19,312	10,043		15,256	11,537	9,552	2,102	3,292	2,771	2,628
" —Over 24" Dia.—To 96" c.-c.	141,417	18,160	24,067	16,700		33,413	12,411	14,932	8,795	5,185	3,857	3,897
" —Over 24" Dia.—Over 96" c.-c.	344,028	47,958	43,229	56,391		72,753	27,655	33,080	28,091	15,697	11,389	7,785
Turret —12" Dia. 2½" Bar and up	94,086	13,653	19,340	14,357		20,433	12,563	4,670	1,858	535	4,033	2,624
" —To 24" Dia. 2½" Bar and up	169,196	21,360	23,545	22,477		25,991	16,388	16,284	7,302	9,869	9,189	6,791
" —Over 24" Dia. 2½" Bar and up	42,686	3,119	5,612	6,207		8,238	6,541	3,859	3,012	3,926	1,046	1,126
Automatic—12" Diameter	17,238	2,485	2,096	1,076		811	7,343	1,134	336	612	1,152	193
" —To 24" Diameter	18,091	2,002	1,614	226		1,731	2,213	402		2,934	6,776	193
" —Over 24" Diameter	2,561		816	48		168	1,473					56
SCREW MACHINES												
Automatic—Single 1"	7,612	14,211	25,728	8,243		13,880	8,870	1,838	552	204	2,704	1,382
" —Single to 3"	78,311	13,957	16,086	8,803		15,026	14,209	3,370	816	1,526	3,522	276
" —Single—Over 3"	16,741	2,522	2,130	1,518		2,326	6,599	404	108	292	842	
" —Multiple—To ⅛"	6,109	584	1,110	1,568		534	560				1,653	
" —Multiple—To 1"	98,344	20,134	17,636	9,645		14,797	14,847	3,438		1,970	14,929	948
" —Multiple—To 3"	68,398	11,017	8,543	8,820		15,511	12,608	4,501		2,184	4,968	546
" —Multiple—Over 3"	5,057	143	108	116		1,136	2,910			300	344	
MILLING												
Standard Type—Horizontal—No. 3	225,625	46,094	36,785	23,502		43,250	28,215	13,438	7,609	5,523	13,695	7,514
" " —Horizontal—Over No. 3	113,841	15,072	21,710	17,929		23,496	10,061	6,742	4,153	5,285	6,459	2,975
" " —Vertical—No. 3	42,621	12,265	6,680	2,817		8,303	5,677	1,478	566	468	3,882	485
" " —Vertical—Over No. 3	46,459	13,756	3,561	7,044		9,661	4,589	1,329	642	1,163	3,968	846
Mfg.—Horizontal—12" table width	28,224	9,053	4,645	1,393		4,055	5,148	897	120	837	1,165	830
" —Horizontal—Over 12" table width	17,621	2,726	1,959	697		5,509	4,775	842		260	636	217
Planer—Over 30" table width—slab mill	8,026	2,202	1,132	1,078		1,972	346	500			184	612
" —Over 30" table width—side spdl.	3,004	511	186	1,387		185	159	144	168			264
" —Over 30" table width—vert. spdl.	7,110	1,540	1,697	867		1,379	307		148		558	614
" —Over 30" table width—side and vert.	7,683	1,826	617	386		2,295	1,734	192		60	441	132
Misc. and Dia. Cutting—Heller Type	20,025	5,837	5,264	1,404		4,438	1,162	316		688	916	
PLANERS												
60" wide to 15'	11,278	822	1,350	1,947		2,813	1,829	1,131	1,006	150	230	
60" wide, over 15'	5,286	870	241	790		1,220	845	554	368		230	168
Over 60" wide to 15'	2,735	278	517	501		538	168	202	37	98	144	252
Over 60" wide, over 15'	7,124	1,004	1,199	1,857		1,961	232	279	2	88	174	326
THREADERS												
External Mills	30,331	6,801	3,917	3,381		4,488	3,227	864	928	2,494	3,237	894
Internal Mills	3,666	66	209	193		1,326	1,260	216	336	60		
TOTAL AVAILABLE HOURS	3,350,315	599,336	559,829	397,714		677,010	405,687	209,744	112,673	111,467	142,636	84,220

The available critical tool hours per week here shown are based on an 168-hour week and represent usable tool hours subject to operating labor available. Reports are based on initial inspection of the plants concerned by engineers trained for this work. The War Production Board Field Offices are acting as clearing houses for all public or private contractors or agencies interested in using these facilities.

When making inquiries regarding the availability of these critical tool hours for specific jobs, communicate in detail with the Regional Supervisor, Critical Tools Service, in the WPB Region best located for your job. They are:

Region	*Supervisor*	*Assistant*	*WPB Office*
No. 1 Boston	R. F. Wood	H. H. Whitcomb	17 Court Street
No. 2 New York	J. J. Carroll	C. Philippi	122 E. 42nd Street
No. 3 Philadelphia	C. E. Reinicker	R. V. Hilands	1617 Penn. Blvd.
No. 5 Cleveland	C. J. Perrier	C. R. Griffith	Union Commerce Bldg.
No. 6 Chicago	S. C. Bloom	W. I. Buhl	20 N. Wacker Dr.
No. 7 Kansas City	W. A. Crooks	P. J. Leonard	Mutual Interstate Bldg.
No. 8 Dallas	B. P. Rhineford	W. E. White	4th Fl., Fidelity Bldg.
No. 10 San Francisco	M. Brookman	S. W. Liftchild	1355 Market St.
No. 11 Detroit	R. O. Cunningham	J. B. Shepard	7310 Woodward Avenue
No. 12 Minneapolis	E. H. Pitney		326 Midland Bk. Bldg.

MACHINE TOOLS

. . . *Sales, Inquiries and Market News*

Subcontractors Favored by Plan To Cancel Machine Orders

Washington

• • • **Following publicity** of a WPB report to the effect that many machine tools in Detroit were standing idle or were in use as little as three hours a day has caused the Army and Navy to agree to cancel contracts for new machine tools and equipment where the work for which the machine tools were being sought could be done by subcontractors. Such was the gist of an announcement by Smaller War Plants, Inc., this week.

It was stated as a part of the WPB disclosure on the idleness of machine tools that if all the unused or little used machine tools were properly utilized, perhaps by requisition, that a great part of the new machine tool building could be halted, thus relieving sorely needed skilled manpower and vital materials now being expended on new tooling.

It was also pointed out by Lou E. Holland, head of Smaller War Plants, Inc., that fewer subcontracts were being let during the last few weeks owing to the fact that many prime contractors had received new tools which would be assigned to operations previously subcontracted. This was intimated as being wasteful of available manpower and machine tool capacity in the shops of small contractors at the expense of the overloaded machine tool industry, whose commendable efforts have performed well in staving off a complete production bottleneck from tool shortages.

•

Tax Bill Threatens Reserves

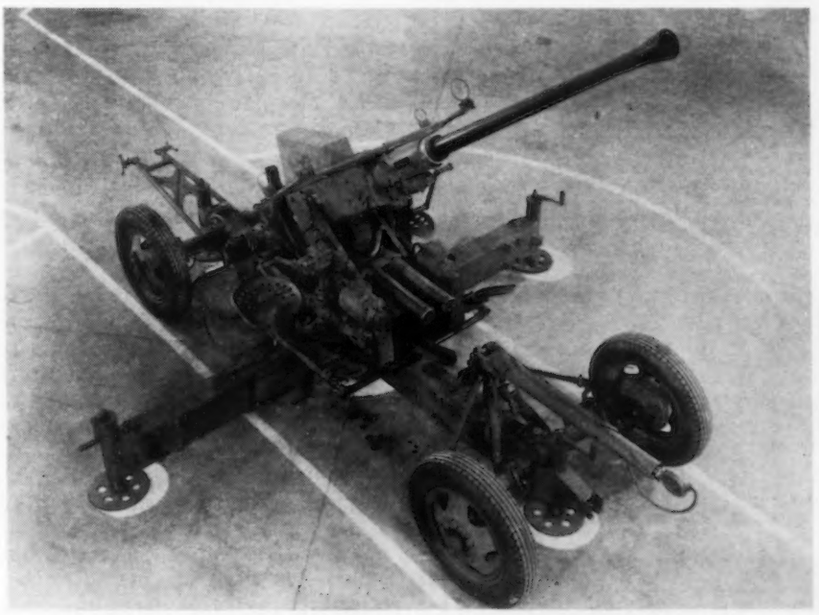
Cincinnati

• • • **With the end of the year** just around the corner, and Congress just having handed out a new tax bill, district machine tool men are pondering their positions in the light of the new tax provisions. While all citizens had anticipated a heavy tax bill and were willing, of course, to accept it, machine tool builders find that the problem of building reserves against lean years under the present tax structure is posing a very difficult problem. The industry has always recognized the fact that its money-making curve was subject to wild girations, and policy has always been adopted of laying aside some reserve during the lean years to take care of the depressions in the curve. Many companies in the area have been planning for the period when the present heavy ordering would ease down, by attempting to establish some reserve. This present tax bill, of course, raises serious doubt as to whether that can be done and even if it can, the renegotiation of war contracts may wipe out what the tax bill does leave.

So far as new business is concerned, there continues to be a reasonably steady flow of orders, although the flurry has apparently, definitely passed.

•

BOFORS ANTI-AIRCRAFT GUN: Here's a gun you don't often get a good look at—the 40mm. Bofors. This particular gun won Dr. J. L. Miller, chief metallurgist of the Gun Mount Div., Firestone Tire and Rubber Co., the second Grand Award of $11,200 in the Lincoln Arc Welding Foundation study program. Dr. Miller redesigned the gun mount from riveted to welded construction.



Aircraft Tool Preference Explains Industry Mix-Up

• • • **Some confusion** has arisen since the machine tool industry was requested last week by George Brainard, chief of the WPB Machine Tool Branch, to increase production, and when on Friday of last week General Somervell ordered reduction in the output of machine tools for ordnance production.

A WPB spokesman made it clear to THE IRON AGE that emphasis is to be put on production of tools for the aircraft industry. Accordingly, the Army revised its relative urgency list, putting aircraft machine tools on top, and last Thursday WPB issued an amendment to E-1-b directing that the air services be given preference up to 75 per cent of the output of any machine tool.

Whitney Consultant to Nelson

• • • **H. Leroy Whitney,** former Director and Chief Engineer of the Fabricated Products Division of the M. W. Kellog Co., Jersey City, has been appointed as technical consultant to Donald M. Nelson, WPB Chairman.

NON-FERROUS METALS

. . . Market Activities and Price Trends

Magnesium Still Leads Scarce Materials List

• • • **Magnesium continues** our most urgently needed vital material, according to the sixth Material Substitution and Supply list, issued last week by the WPB. Aluminum, copper, tin, bronze, brass, cadmium and zinc, in that order, are also listed as most desperately needed for war demands. Listed as inadequate in supply but less severely so, are molybdenum, nickel, vanadium, tungsten, chromium and chrome-nickel.

Group II of the list, materials which are also essential to war needs but supplies of which are approximately in balance with immediate demand, includes platinum, mercury, silver, zirconium and silicomanganese.

Gold, indium, lead, osmium, palladium and sodium are the only non-ferrous metals available in quantities exceeding demand, and recommended as substitutes for scarcer metals. Of course the only one of these with possibilities at all broad is lead. Among its other new roles, this metal is finding wide use as a wrapping foil in the rapidly growing dehydrated food industry, according to the Lead Industries Association. Other new uses of lead mentioned by the association are as a substitute for tin in collapsible tubes; for brass in closet floor flanges, drum trap covers and rings, name plates, mechanical pencils and hardware; for rubber in chemical tank linings, gaskets and washers; for copper in fire extinguishers, roofing, flashing and plumbing; and for zinc, cadmium, chromium and nickel in metallic coatings.

Eighteen tons of scarce metals will be saved in the manufacture of General Electric war products this year, through a new non-magnetic manganese alloy. (See THE IRON AGE, Oct. 1, p. 51.)

The new alloy, a substitute for 18-8 stainless, will free 10 tons of nickel, seven tons of chromium and almost one ton of tin for other war uses. The tin is saved through substitution of lead coating.

According to J. Q. Adams, steel specialist in the company's Schenectady works laboratory, the alloy can be expected to remain in general use when the war ends and chromium, nickel and tin again will be in common use.

Bars, rods and plates made of the new alloy are used in motor-generators for submarines, control equipment for planes and tanks, and in switchgear equipment and motors for war industry generally. Wire made of the alloy has equally wide application, chiefly in electric locomotives. In this application the wire is wound tightly around the armatures of direct-current motors and soldered.

Several extensive magnesium-bearing deposits in the Boulder Dam area of Nevada and California which possibly can be used as additional sources of raw material for the Basic Magnesium plant at Las Vegas, are described in a recently-published information circular of the Bureau of Mines.

Utilization of these deposits depends "only upon the development of an economical method of recovering the contained magnesium oxide," the report said. At present, the new plant is using crude magnesium oxide obtained from the extensive Luning magnesite deposits in the Paradise Mountain range, about 325 miles by road from the plant. The Luning magnesite must be treated in a $5,000,000 milling and calcining plant at Luning and then transported by a circuitous rail route of approximately 1000 miles to the main plant, via Salt Lake City, because there is no direct-line rail

C-F POSITIONERS are universal tools . . . for handling and holding work

★ Capable of tilting, turning and holding giant weldments and assemblies so that every weld can be made down hand, C-F Positioners also save time, labor and lower the cost of positioning and holding work for chipping, snagging, grinding, flame hardening and machining operations like angular drilling, etc. Today C-F Positioners are found not only in welding shops but in machine shops, die shops and production lines as well. 6 sizes, capacities from 1,200 lbs. (hand operated) to 30,000 lbs. Each a universal tool, pedestal mounted, adjustable for height, with table that turns completely around and tilts at any angle to 135° from horizontal.

Write for Bulletin WP 22.

(Right) Illustrates how "C-F" adjustable height feature assures ample floor clearance for "any" job.

CULLEN-FRIESTEDT CO.,
1303 S. KILBOURN AVE. CHICAGO, ILLINOIS

connections between the main plant and Luning.

Two of the more extensive low-grade magnesite deposits which are more accessible to Las Vegas than the Luning magnesite are near Overton, Nev., about 40 miles northeast of Las Vegas. At least five other low-grade deposits occur in the Boulder Dam area (within 200 miles of the dam). In addition, the area contains "an almost inexhaustible source" of magnesium in dolomite deposits the report said. The bureau has conducted preliminary experiments on several processes for treating high-grade Nevada dolomites to obtain magnesium oxide.

A high frequency electrical method of fusing the tin on electrolytic tin plate has been developed by Westinghouse Electric & Mfg. Co. This new method melts and flows the coating and puts a mirror-like finish on plate carrying only one-third as much tin as under the hot dipped process. The method has the advantages of great flexibility, extreme accuracy, compactness, and the electroplate is not marred through mechanical contact with the melting equipment.

The receipts of tin cans by the detinning plants in September were the highest so far, amounting to 6968 gross tons. The total for the first nine months of the year is 23,213 tons, considerably less than the tonnage that could have been treated in one month. It was not until Oct. 20 that salvaging of cans began in earnest, however, when WPB ordered compulsory collection of cans in more than 400 municipalities.

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Bronze Scrap, Copper Screen, Iridium, Cadmium Price Orders

Consumers of copper and copper alloy scrap who buy high-grade bronze, high lead bronze and other formula-priced grades of scrap in large lots at "cents per pound prices" should have provisos in their contracts stating that if, after a chemical analysis of the lot purchased, it is determined that the contract price is higher than the OPA maximum price, only the OPA maximum will be paid, the Office of Price Administration said last week. Price formulas for determining ceilings for high-grade bronze and high lead bronze are contained in Revised Price Schedule No. 20, as amended.

Prices at which the Metals Reserve Co. and its agents may buy idle or excessive stocks of copper base alloy insect screening, cadmium and iridium were established last week by OPA. Screening prices, set in order No. 5 to price regulation 204 are the net price paid by the holder plus 10 per cent, f.o.b. cars.

A price of 95c. is set, under order No. 6 of the same price regulation, for cadmium anodes and cadmium oxide, 90c. for pigs, slabs and other regular straight or flat forms, and 35c. per lb. of contained cadmium, for cadmium scrap. Udylite Corp. has been appointed by MRC to assist, as its agent, in cadmium stockpiling and allocation. Prices are f.o.b. its plant, Detroit.

Iridium alloy prices, as set in order No. 7 are: for contained iridium $140 per troy oz., f.o.b. National Bureau of Standards, Washington; other precious metals, $32 per contained troy oz., palladium, $18 per contained troy oz. MRC has named Baker & Co., Inc., Newark, its agent in buying iranium scrap materials.

Elimination of Ten Billion Cans Forecast

• • • Ten billion cans are being eliminated from the packaging field, according to Edward J. Detgen, chief of the specialties staff of the Department of Commerce. In an address before the Glass Container Association Mr. Detgen said that glass containers are taking over a good portion of this volume. The elimination of metal cans for certain purposes, he said, will save approximately 500,000 tons of steel and 5000 tons of tin annually.

Metal will be needed for closures of the glass containers, however, and Mr. Detgen pointed out that many of the products which have been denied metal containers have also been denied metal closures.

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Your Plant Help To W
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Speed your assemblies with accurately formed Triplex Cap Screws, Bolts and Nuts that fit and tighten cleanly, quickly, avoiding delays caused by misfits. Write today for new information on deliveries — some items ready for immediate shipment. The Triplex Screw Co., Box 1768, Newburgh Station, Cleveland, Ohio.
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CAP AND SET SCREWS • BOLTS • NUTS AND RIVETS
MILLIONS IN USE • EVERYWHERE

SCRAP

. . . Market Activities and Quotation Trends

Mixed Trends Noted In Scrap Shipments; Ingot Output Holds

• • • **Scrap reservoirs** strengthened through campaigns were supporting steel ingot output this week close to the all-time peak, but in a few consumption districts shipments were reported easing.

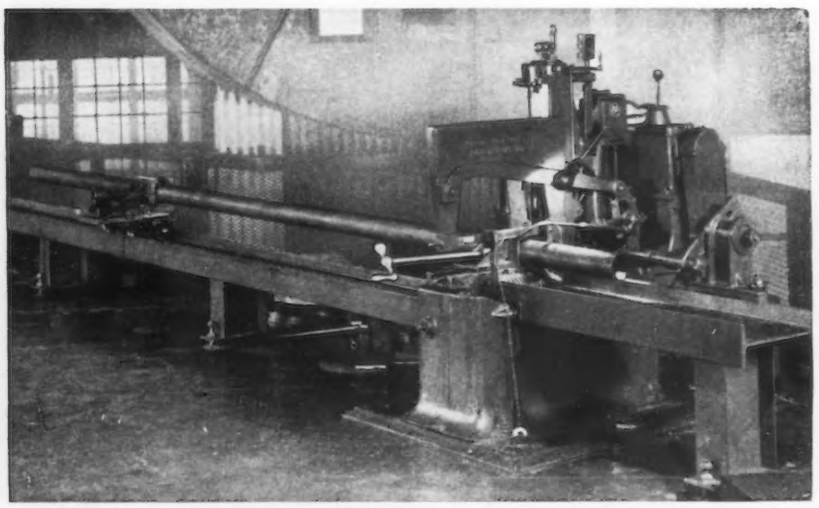
At St. Louis, Birmingham, Pittsburgh, Philadelphia and a few other cities improvement in both quantity and quality of scrap was noted. Districts where declining volume was reported were led by Chicago, where the drop has been chiefly in railroad and farm scrap.

At Buffalo the labor situation continued to distress scrap yard operators whose appeals for workers were unavailing. The same trouble is evident over the nation in varying degrees. Workers can earn more pay in factories than in scrap yards.

Intensified and continued industrial drives for scrap, plus renewal of the household campaign at a later date are seen as the chief salvation of the scrap situation.

Considerable household scrap still remains in its original piles, particularly in small towns. At length it will be moved, but the problem of arranging transportation is steadily growing more serious.

The experiment at Pittsburgh in using air raid wardens as scrap collectors was declared highly successful by observers. Even though a previous drive had been conducted, the wardens collected more scrap than expected. In some quarters there it was stated that household scrap had been cleaned up.



cut-off metal the economical way

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For cast automatic production or for single-cut miscellaneous work, MARVEL 6A or 9A Hack Saws are fast, accurate tools. Capacities 6" x 6" or 10" x 10", single or nested bars. Write today for Bulletin N. 600.

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"The Hack Saw People"
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Priorities Aid for Scrap Yards Granted

• • • **Scrap dealers' yards** and automobile graveyards are aided in securing necessary repair and maintenance material by an order issued Nov. 6 by the Director General for Operations.

The new order (P-136) assigns the following preference ratings to deliveries to processors of metal scrap:

1. AA-2X for essential and immediately needed repair materials and parts to remedy a breakdown or suspension of operations.
2. AA-3 for repair materials and parts up to the minimum required to guard against breakdown of operations.
3. A-1-a for repair materials, spare parts and operating supplies to a total value not in excess of $500 for a calendar quarter year.

The order recognizes the important part played by auto graveyards and metal scrap yards in processing scrap metal. Previous to the issuance of this order, these yards had to secure their necessary repair, maintenance and operating supplies on an A-10 rating, under P-100.

To obtain the higher ratings provided in the new order, each processor (yard owner) must first be certified by the Auto Graveyard Section of WPB's Conservation Division as an experienced operator in the scrap trade, cooperating in expediting the movement of metal scrap to consumers.

He then will file with WPB an account of raw material used for repair, maintenance and operating supplies for the preceding calendar quarter, an inventory of such material at the beginning and end of the period, and an estimate of requirements of such material for the current quarter.

At present, there are 18,000 automobile graveyards and 6000 scrap yards that may be assisted by Order P-136.

•

Hunters Urged to Assist Scrap Campaigns

• • • **"Be salvage-minded** when you go hunting this season," is the admonition directed to hunters by Dr. Ira N. Gabrielson, director, Fish and Wildlife Service, United States Department of the Interior.

Hunters should save shot-gun shells, rifle cartridges, down feathers, and the fats and hides from game animals, he said. They can spot scrap iron and steel discarded in fields.

•

YOUNGSTOWN, OHIO—Dealers here have reduced prices they will pay for metal gathered in salvage campaigns to 60c. per 100 lbs. or $13.44 a gross ton effective immediately. Dealers explained that the previous price of 75c. per 100 lbs. or $16.80 a gross ton was "by far the highest price paid anywhere."

Other prices paid are 55c. per 100 lbs. in Pittsburgh, 58c. in Cleveland, 60c. at Massillon, 48c. at Erie, Pa., and 50c. per 100 lbs. at Franklin and Oil City, Pa.

•

BUFFALO—The labor situation continues to harass proprietors of Buffalo's scrap yards, most of which remain plugged as a result of the recent newspaper drive. There have been no responses to appeals for scrap yard workers and the U. S. Employment Service has just declared there are no free male workers left in Buffalo. The service has asked for 9000 women to register for work, but it is doubtful if any of these would serve for scrap duty although more than a score now are working as hostlers and all-round roustabouts in railroad engine houses. Movement of scrap to the mills is around 50 per cent of capacity. However, mill reserves are ample for two months.

•

TORONTO—Receipts by local dealers continue in big volume and yard holdings are increasing steadily. Dealers complain of labor shortages and are unable to cope with the big outpouring of scrap. Salvage campaign has started in 40 southern Ontario counties. The price paid will be $7 for scrap on ground at collection points; $8.50 on cars of less than 25 tons and $10 on cars containing more than 25 tons. Groups may pool their accumulations and load jointly.

•

CINCINNATI—The situation in this area is easier with dealers indicating that the flow of material has exceeded their expectations. In fact, predictions are now being made that they can see no considerable loss in production because of scarcity of scrap during the winter. Surpluses in the South and West on cast grades of scrap are expected to assist materially in the foundry markets if allocations suggested by the industry are followed.

•

BIRMINGHAM—Considerable improvement is shown here. Mills have fairly good inventories. Much scrap is going on allocations to such Northern points as Pittsburgh, Cleveland, Youngstown, Canton and Warren.

•

PITTSBURGH—Supplies are still fairly free here and the increase in scrap material has allowed the maintenance of a substantially high ingot rate. The building up of supplies for winter months probably has progressed more slowly here than at other points owing to the fact scrap needs are far greater than scrap production in this area. The main question mark still continues to be what will happen next February when nonrecurrent scrap has been exploited fully.

•

NEW YORK—The first barge load of household drive scrap which Bethlehem Steel Co. is taking direct from the city reached Elizabethport, N. J., last Friday. It will be processed in the Bethlehem yard there. City officials expect the Bethlehem scrap to move at a rate of about 400 tons a week.

•

ST. LOUIS—The scrap situation has improved in amount arriving and average quality of offerings. Reflecting activity of the industrial drive, more heavy, workable material is coming out as contrasted with results of the school and general collection. One leading mill added 2000 tons to its inventory in October and smaller accretions were reported by several other melters. St. Louis produced 39,981 tons of its 72,000 quota and Missouri, with two counties missing, 103,596 out of quota of 265,000 in October. Leaders of both city and state campaigns confidently expect completion of quotas by Christmas.

CHICAGO—A recent decline of shipments into consumption is reported in several directions here. The drop has been chiefly in railroad and farm scrap. While mills are still obtaining sufficient scrap to maintain present high rates, they have not been able to build up adequate stock piles for the winter. Hence the slowing down of shipments has changed much of the recent optimism. Intensified and continued industrial drives, plus intensified general salvage, such as the old WMI was to undertake, are seen as the chief salvation of the scrap situation. One of the new Inland Steel blast furnaces, which is expected to come into blast some time in the first two weeks of December, is expected to ease this district's scrap problem somewhat, but will not solve it.

•

PHILADELPHIA—For the fifth week in succession scrap shipments here have shown an increase. All steel companies in the area report an increase in scrap inventories and the Pencoyd plant of Carnegie-Illinois has held up further scrap shipments for a week due to lack of storage space. The bulk of the increase is credited to local civic and dormant scrap drives. Cast iron scrap is also reported as being more plentiful due to the great amount released from foundries, cast iron pipe manufacturers, etc.

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ELECTRIC SEAM WELDING

(longitudinal & circular)

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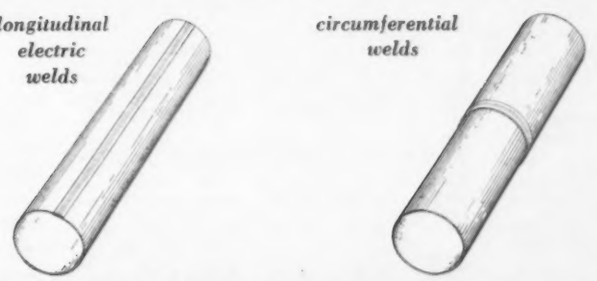


HARRISON SHEET STEEL COMPANY

4718 west Fifth Avenue, Chicago

IRON AND STEEL (OTHER THAN RAILROAD) SCRAP

(All Prices Are Per Gross Ton)

	BASIC OPEN HEARTH GRADES (No. 1 Heavy Melting; No. 1 Hydr. Compressed Black Sheets, No. 2 Heavy Melting; Dealers' No. 1 Bundles; Dealers' No. 2 Bundles; No. 1 Busheling)	Unbaled* Machine Shop Turnings	BLAST FURNACE GRADES (Mixed Borings and Turnings; Shovelling Turnings; No. 2 Busheling; Cast Iron Borings)	No. 2 Busheling	ELECTRIC FURNACE, ACID OPEN HEARTH AND FOUNDRY GRADES									
					Low Phos.		Heavy Structural and Plate			Cut Auto Steel Scrap				
					Billet, Bloom, Forge Crops	Bar Crops, Punchings Plate Scrap and Cast Steel	3 ft. and Under	2 ft. and Under	1 ft. and Under	3 ft. and Under	2 ft. and Under	1 ft. and Under and Auto. Springs, and Crankshafts	Alloy Free Low Phos. and Sulphur Turnings	Heavy Axle and Forge Turn. First Cut	Electric Furnace Bundles
Pittsburgh, Brackenridge, Butler, Monessen, Midland, Johnstown, Sharon, Canton, Steubenville, Warren, Youngstown, Weirton	$20.00	$16.00	$16.00	$17.50	$25.00	$22.50	$21.00	$21.50	$22.00	$20.00	$20.50	$21.00	$18.00	$19.50	$21.00
Cleveland, Middletown, Cincinnati, Portsmouth	19.50	15.50	15.50	17.00	21.50	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50
Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville, Sparrows Pt.	18.75	14.75	14.75	16.25	23.75	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75
Ashland, Ky.	19.50	15.50	15.50	17.00	24.50	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50
Buffalo, N. Y.	19.25	15.25	15.25	16.75	24.25	21.75	20.25	20.75	21.25	19.25	19.75	20.25	17.25	18.75	20.25
Bethlehem, Pa.; Kokomo, Ind.	18.25	14.25	14.25	15.75	23.25	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25
Duluth, Minn.	18.00	14.00	14.00	15.50	23.00	20.50	19.00	19.50	20.00	18.00	18.50	19.00	16.00	17.50	19.00
Detroit, Mich.	17.85	13.85	13.85	15.35	22.85	20.35	18.85	19.35	19.85	17.85	18.35	18.85	15.85	17.35	18.85
Toledo, Ohio	...	13.85	13.85	15.35	...	...	...	...	...	...	...	...	...	...	...
St. Louis, Mo.	17.50	13.50	13.50	15.00	22.50	20.00	18.50	19.00	19.50	17.50	18.00	18.50	15.50	17.00	18.50
Atlanta, Ga.; Alabama City, Ala.; Birmingham, Los Angeles; Pittsburgh, Cal.; San Francisco	17.00	13.00	13.00	14.50	22.00	19.50	18.00	18.50	19.00	17.00	17.50	18.00	15.00	16.50	18.00
Minnequa, Colo.	16.50	12.50	12.50	14.00	21.50	19.00	17.50	18.00	18.50	16.50	17.00	17.50	14.50	16.00	17.50
Seattle, Wash.	14.50	10.50	10.50	12.00	19.50	17.00	15.50	16.00	16.50	14.50	15.00	15.00	12.50	14.00	15.50

***Baled turnings are $4 per gross ton higher. Dealers may charge $2 per ton for crushing other than heavy turnings. An industrial producer may charge $1.**

BUNDLES: Tin can bundles are $4 below dealers' No. 2 bundles; No. 3 bundles are $2 less than No. 1 heavy melting.

SWITCHING CHARGES: Deductions for shipping points within basing points (cents per gross ton) are: Pittsburgh, Brackenridge, 55c.; Midland, Johnstown, Sharon, Youngstown, Warren, Weirton, Cleveland, Toledo, Los Angeles, San Francisco, 42c.; Butler, Monessen, Canton, Steubenville, Cincinnati*, Portsmouth, Ashland, Coatesville, Harrisburg, Phoenixville, Bethlehem, Kokomo, Duluth, St. Louis, 28c.; Buffalo, Claymont, 36c.; Conshohocken, 11c.; Atlanta, Birmingham, 32c.; Pittsburg, Cal., 42c.; Middletown, 14c.; Sparrow's Point, 11c.; Chicago, 84c.; Detroit, 53c.; Alabama City, 26c.; Minnequa, 22c.; Seattle, 38c. *At Cincinnati, for basic open hearth grades, cut auto scrap and auto springs and crankshafts, deduct 80c. per ton.

PITTSBURGH basing point includes switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport, Cincinnati basing point includes Newport, Ky., switching district. St. Louis includes switching districts of Granite City, East St. Louis, Madison, Ill. San Francisco includes switching districts of S. San Francisco, Niles and Oakland, Cal.

MAXIMUM prices of inferior grades shall continue to bear same differential below corresponding grades as existed during the period Sept. 1, 1940, to Jan. 31, 1941. Superior grades cannot be sold at a premium without approval of OPA. Special preparation charges in excess of the above prices are banned. Whenever any electric furnace or foundry grades are purchased for open hearth or blast furnace use, prices may not exceed the prices above for the corresponding open hearth grades.

MAXIMUM SHIPPING POINT PRICE—Where shipment is by rail or vessel, or by combination of rail and vessel, the scrap is at its shipping point when placed f.o.b. railroad car or f.a.s. vessel. In such cases, the maximum shipping point prices shall be: (a) For shipping points located within a basing point, the price listed in the table above for the scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point and (b) for shipping points located outside the basing point, the price in table above at the most favorable basing point minus the lowest transportation charge by rail or water or combination thereof. In lieu of dock charge add 75c. a ton*, but 50c. if moved by deck scow or railroad lighter. Shipping by motor vehicle: The scrap is at its shipping point when loaded. For shipping points located within basing points take price listed in table minus applicable switching charge. If located outside a basing point, the price at the most favorable basing point minus lowest established charge for transporting by common carrier. If no established transportation rate exists, the customary costs are deducted. Published dock charges prevail. If unpublished include 75c.* For exceptions see official order.

AT NEW YORK city or Brooklyn, the maximum shipping point price is $15.33 for No. 1 heavy melting, f.o.b. cars, f.a.s. vessel or loaded on truck. Other grades carry differentials similar to those in table. New Jersey prices must be computed on basis of all-rail. At Boston the maximum is $15.05 for No. 1 f.o.b. cars, f.a.s. vessel or loaded on trucks. Shipments from a New England shipping point to a consumer outside New England carry maximum transportation charge of $6.65 per ton.

UNPREPARED SCRAP: For unprepared scrap, maximum prices shall be $2.50 (and in the case of the material from which No. 1, No. 2, and No. 3 bundles are made $4) less the maximum prices for the corresponding grade or grades of prepared scrap. In no case, however, shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Converter may charge $2.50 per ton on consumer-owned unprepared remote scrap (see order). A preparation-in-transit charge for allocated unprepared scrap is provided.

Maximum price of all scrap in a vehicle is that of the lowest price grade in the shipment. This limitation does not apply to vessel shipments if grades are segregated.

Where scrap is to undergo preparation prior to its arrival at the point of delivery, such scrap is not at its shipping point, as that phrase is defined above, until after preparation has been completed. For special preparation charges, consult official order.

CHEMICAL BORINGS: No. 1 (new, clean, containing not more than 1 per cent oil), $1 less than No. 1 heavy melting; No. 2 (new, clean, containing not more than 1.5 per cent oil), $2 less than No. 1 heavy melting. If loaded in box cars add 75c.

UNPREPARED CAST IRON SCRAP—Except for heavy breakable cast, unprepared scrap is given a price ceiling of $2.50 per ton less than the maximum prices for the corresponding grade of prepared cast iron scrap. Where scrap is to undergo preparation prior to arrival at the point of delivery, such scrap is not considered at shipping point until preparation is completed.

Consumers of cast scrap may pay the shipping point price plus established charge for transporting the scrap to their plants. In the case of deliveries by truck, the cast scrap buyer must obtain from the seller a certification, made out to OPA.

*At Memphis 50c.; Great Lakes ports $1; New England $1.25.

RAILROAD SCRAP

	No. 1 RR Heavy Melting	Scrap Rails	Rails for Rerolling	Scrap Rails 3 ft. and Under	Scrap Rails 2 ft. and Under	Scrap Rails 18 in. and Under
Cleveland, Cincinnati, Ashland, Portsmouth, Middletown	$20.50	$21.50	$23.00	$23.50	$23.75	$24.00
Canton, Pittsburgh Sharon, Steubenville, Wheeling, Youngstown	21.00	22.00	23.50	24.00	24.25	24.50
Chicago, Philadelphia, Sparrows Pt., Wilmington	19.75	20.75	22.25	22.75	23.00	23.25
Birmingham, Los Angeles, San Francisco	18.00	19.00	20.50	21.00	21.25	21.50
Buffalo	20.25	21.25	22.75	23.25	23.50	23.75
Detroit	18.85	19.85	21.35	21.85	22.10	22.35
Duluth	19.00	20.00	21.50	22.00	22.25	22.50
Kansas City, Mo.	17.00	18.00	19.50	20.00	20.25	20.50
Kokomo, Ind.	19.25	20.25	21.75	22.25	22.50	22.75
Seattle	15.50	16.50	18.00	18.50	18.75	19.00
St. Louis	18.50	19.50	21.00	21.50	21.75	22.00

CAST IRON SCRAP

	Group A	Group B	Group C
No. 1 cupola cast	$18.00	$19.00	$20.00
No. 1 machinery cast, drop broken, 150 lbs. and under	18.00	19.00	20.00
Clean auto cast	18.00	19.00	20.00
Unstripped motor blocks	17.50	18.50	19.50
Stove Plate	17.00	18.00	19.00
Heavy Breakable Cast	15.50	16.50	17.50
Charging Box Size Cast	17.00	18.00	19.00
Misc. Malleable	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas Oklahoma, Texas and Florida.

Group C: States not named in A and B; switch district of Kansas City, Kan., Mo.

. . . Composite Prices

Advances Over Past Week in **Heavy Type**; Declines in *Italics*. (Prices Are F.O.B. Major Basing Points)

Flat Rolled Steel: (Cents Per Lb.)	Nov. 10, 1942	Nov. 2, 1942	Oct. 13, 1942	Nov. 11, 1941
Hot rolled sheets	2.10	2.10	2.10	2.10
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.10
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Plates, wrought iron	3.80	3.80	3.80	3.80
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00
Tin and Terne Plate: (Dollars Per Base Box)				
Tin plate, standard cokes	$5.00	$5.00	$5.00	$5.00
Tin plate, electrolytic	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30
Bars and Shapes: (Cents Per Lb.)				
Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wrought iron bars	4.40	4.40	4.40	4.40
Wire and Wire Products: (Cents Per Lb.)				
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.55
Rails: (Dollars Per Gross Ton)				
Heavy rails	$40.00	$40.00	$40.00	$40.00
Light rails	40.00	40.00	40.00	40.00
Semi-Finished Steel: (Dollars Per Gross Ton)				
Rerolling billets	$34.00	$34.00	$34.00	$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00
Wire Rods and Skelp: (Cents Per Lb.)				
Wire rods	2.00	2.00	2.00	2.00
Skelp (grvd)	1.90	1.90	1.90	1.90

Pig Iron: (Per Gross Ton)	Nov. 10, 1942	Nov. 2, 1942	Oct. 13, 1942	Nov. 11, 1941
No. 2 fdy., Philadelphia	$25.89	$25.89	$25.89	$25.84
No. 2, Valley furnace	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti	24.68	24.68	24.68	24.06
No. 2, Birmingham	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa.	25.39	25.39	25.39	25.34
Basic, Valley furnace	23.50	23.50	23.50	23.50
Malleable, Chicago†	24.00	24.00	24.00	24.00
Malleable, Valley	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago	31.34	31.34	31.34	31.34
Ferromanganese‡	135.00	135.00	135.00	120.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.
‡For carlots at seaboard.

Scrap: (Per Gross Ton)				
Heavy melting steel, P'gh.	$20.00	$20.00	$20.00	$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.85
Low phos. plate, Youngs'n	22.50	22.50	22.50	23.00
No. 1 cast, Pittsburgh	20.00	20.00	20.00	22.00
No. 1 cast, Philadelphia	20.00	20.00	20.00	24.00
No. 1 cast, Ch'go	20.00	20.00	20.00	20.00
Coke, Connellsville: (Per Net Ton at Oven)				
Furnace coke, prompt	$6.00	$6.00	$6.00	$6.125
Foundry coke, prompt	6.875	6.875	6.875	6.875
Non-Ferrous Metals: (Cents per Lb. to Large Buyers)				
Copper, electro., Conn.	12.00	12.00	12.00	12.00
Copper, Lake, New York	12.00	12.00	12.00	12.00
Tin (Straits), New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25
Lead, St. Louis	6.35	6.35	6.35	5.70
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 141 to 148 herein.

. . . Comparison of Prices

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Nov. 10, 1942	2.30467c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One week ago	2.30467c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One month ago	2.30467c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One year ago	2.30467c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1942	2.30467c.,	2.30467c.,	$23.61	$23.61	$19.17	$19.17
1941	2.30467c.,	2.30467c.,	$23.61, Mar. 20	$23.45, Jan. 2	$22.00, Jan. 7	$19.17, Apr. 10
1940	2.30467c., Jan. 2	2.24107c., Apr. 16	23.45, Dec. 23	22.61, Jan. 2	21.83, Dec. 30	16.04, Apr. 9
1939	2.35367c., Jan. 3	2.26689c., May 16	22.61, Sept. 19	20.61, Sept. 12	22.50, Oct. 3	14.08, May 16
1938	2.58414c., Jan. 4	2.27207c., Oct. 18	23.25, June 21	19.61, July 6	15.00, Nov. 22	11.00, June 7
1937	2.58414c., Mar. 9	2.32263c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 10
1936	2.32263c., Dec. 28	2.05200c., Mar. 10	19.74, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.07642c., Oct. 1	2.06492c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 29
1934	2.15367c., Apr. 24	1.95757c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.95578c., Oct. 3	1.75836c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.89196c., July 5	1.83901c., Mar. 1	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.99629c., Jan. 13	1.86586c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.25488c., Jan. 7	1.97319c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.31773c., May 28	2.26498c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Prices of Finished Iron and Steel...

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, reductions, and in most cases freight absorbed to meet competition.

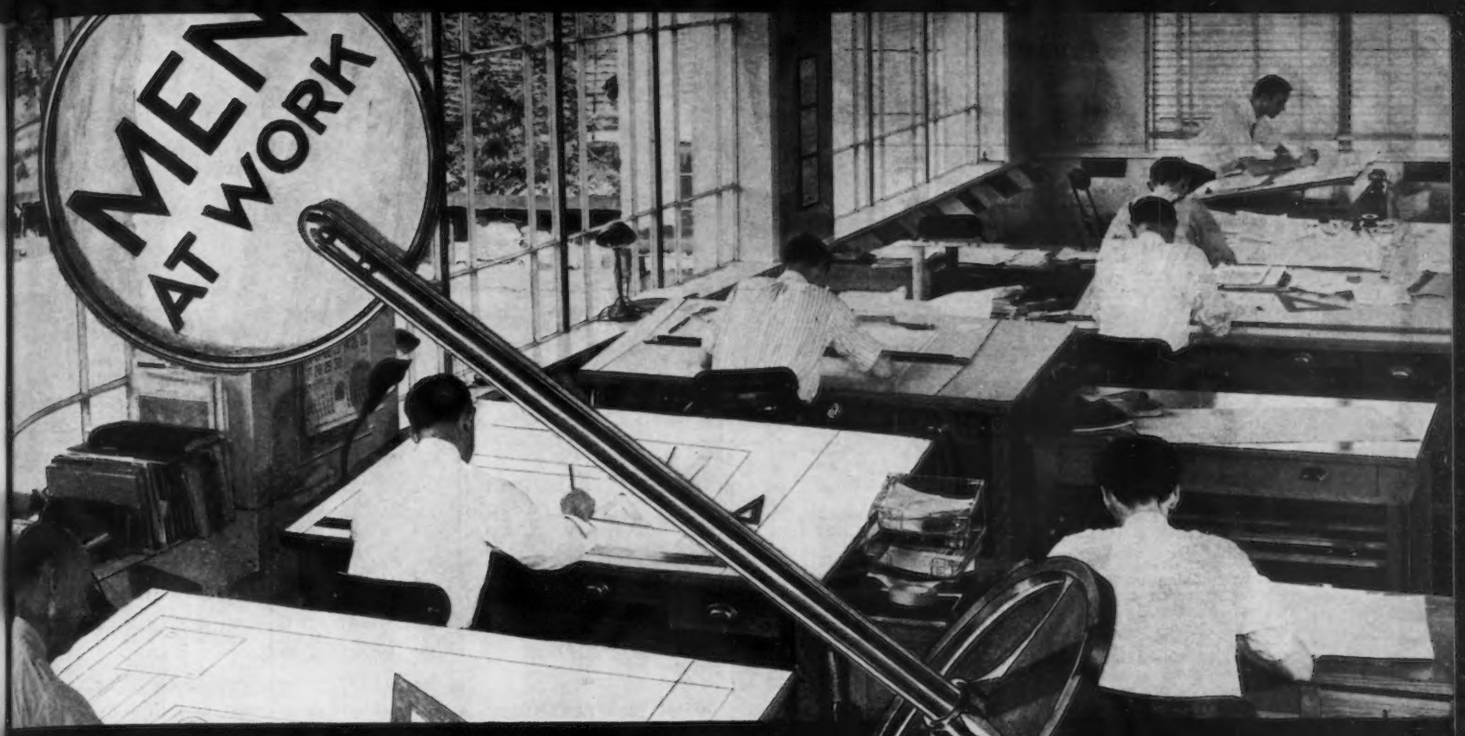
Basing Point → / Product ↓	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	Pacific Ports, Cars[10]	DELIVERED TO Detroit	New York	Philadelphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.22¢	2.35¢	2.28¢
Cold rolled[1]	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.17¢	3.41¢	3.39¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.75¢	3.68¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.47¢	3.73¢	3.69¢
Long ternes[2]	3.80¢		3.80¢									4.55¢		4.18¢	4.14¢
STRIP															
Hot rolled[3]	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.22¢	2.48¢	
Cold rolled[4]	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester = 3.00¢)					2.92¢	3.18¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.58¢	
Commodity C-R	2.95¢			2.95¢			2.95¢	(Worcester = 3.35¢)					3.07¢	3.33¢	
TIN MILL PRODUCTS															
Coke tin plate, base box	$5.00	$5.00	$5.00						$5.10					5.38¢	5.34¢
Electrolytic tin plate, box	$4.50		$4.50												
Black plate, 20 gage[5]	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢[12]			3.39¢
Mfg. ternes, special box	$4.30	$4.30	$4.30						$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)			2.52¢	2.80¢	2.27¢	2.51¢	2.49¢
Rail steel[6]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.52¢	2.80¢			
Reinforcing (billet)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.52¢	2.55¢[13]	2.27¢	2.40¢	
Reinforcing (rail)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.52¢	2.55¢[13]	2.27¢		2.49¢
Cold finished[8]	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit = 2.70c)					3.01¢	2.99¢
Alloy, hot rolled	2.70¢	2.70c				2.70¢	Bethlehem, Massillon, Canton = 2.70c)						2.82¢		
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.47¢		
PLATES							(Coatesville and Claymont = 2.10¢)								
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.25¢[11]		2.47¢	2.65¢	2.33¢	2.30¢	2.155¢
Floor plates	3.35¢	3.35¢									3.72¢	4.00¢		3.73¢	3.69¢
Alloy	3.50¢	3.50¢			(Coatesville = 3.50¢)						3.97¢	4.15¢		3.71¢	3.60¢
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	(Bethlehem = 2.10¢)				2.47¢	2.75¢		2.28¢	2.22¢
SPRING STEEL, C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢			(Worcester = 3.00¢)								
0.51 to 0.75 Carbon	4.30¢			4.30¢			(Worcester = 4.50¢)								
0.76 to 1.00 Carbon	6.15¢			6.15¢			(Worcester = 6.35¢)								
1.01 to 1.25 Carbon	8.35¢			8.35¢			(Worcester = 8.55¢)								
WIRE[9]															
Bright[14]	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70c)					3.10¢			2.94¢
Galvanized	add proper size extra and galvanized extra to bright wire base, above.														
Spring (High Carbon)	3.20¢	3.20¢		3.20¢			(Worcester = 3.30¢)					3.70¢			3.54¢
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.74¢

[1] Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. [2] Unassorted 8-lb. coating. [3] Widths up to 12 in. [4] Carbon 0.25 per cent and less. [5] Applies to certain width and length limitations. [6] For merchant trade. [7] Prices for straight length material only, from a producer to a consumer. Functional discount of 25c. per 100 lb. to fabricators. [8] Also shafting. For quantities of 20,000 to 39,999 lb. [9] Carload lot to manufacturing trade. [10] These prices do not apply if the customary means of transportation (rail and water) are not used. [11] Ship plates only. [12] Boxed. [13] Portland and Seattle price, San Francisco price is 2.50c. [14] This bright wire base price to be used in figuring annealed and bright finish wires, commercial spring wire and galvanized wire.

GOVERNMENT CEILINGS—Price Schedule No. 6 issued April 16, 1941, governs steel mill prices; Price Schedule No. 49 governs warehouse prices, which are on another page of this issue.

EXCEPTIONS TO PRICE SCHEDULE No. 6—On hot rolled carbon bars, Phoenix Iron Co. may quote 2.35c. at established basing points; Calumet Steel division of Borg Warner may quote 2.35c., Chicago, on bars from its 8-in. mill; Joslyn Mfg. Co. may quote 2.35c., Chicago base. On rail steel bars Sweets Steel Co. may quote 2.33c., f.o.b. mill. On hot rolled sheets, Andrews Steel Co. may quote for shipment to Detroit area on Middletown base. On galvanized sheets, Andrews Steel may quote 3.75c., at established basing points. On hot rolled strip, Joslyn Mfg. Co. may quote 2.30c., Chicago base. On plates, Granite City Steel Co. may quote 2.35c., f.o.b. mill, and Central Iron & Steel Co. may quote 2.20c., f.o.b. basing points. On shapes, Phoenix Iron Co. may quote 2.30c. established basing points and 2.50c. Phoenixville for export.

On rail steel merchant bars, Eckels-Nye Corp. may charge 2.40c. On tubing, South Chester Tube Co. may price Gulf or Pacific Coast all rail shipments and shipments west of Harrisburg on basis of f.o.b. Chester. On lend-lease sales to eastern seaboard, Sheffield Steel Co. and Colorado Fuel & Iron Corp. may sell f.o.b. mill. SEMIFINISHED STEEL—Follansbee Steel Corp. may sell forging billets at $49.50 f.o.b. Toronto; Continental Steel Corp. may sell Acme Steel Co. at $34 for rerolling billets plus extras and freight; Ford Motor Co. may sell rerolling billets at $34 f.o.b. Dearborn; Andrews Steel Co. may sell forging billets at $50 at established basing points and slabs at $41; Empire Sheet and Tin Plate may sell slabs at $41 at established basing points and sheet bars at $39 f.o.b. mill; on lend-lease sales Northwestern Steel & Wire Co. may charge $41 per gross ton f.o.b. mill for rerolling billets; on lend-lease sales Wheeling Steel Corp. may charge $36 per ton for small billets, f.o.b. Portsmouth and $37 per ton for sheet bars f.o.b. Portsmouth; Laclede Steel Co. on semifinished sales for lend-lease shipped to eastern seaboard may use Chicago basing point prices f.o.b. Alton and Madison, Ill. ALLOY STEEL BARS—Texas Steel Co. may use Chicago base f.o.b. Fort Worth.



WASTING TIME.

DOES THIS HAPPEN IN YOUR DRAFTING ROOM?

These draftsmen are busy making changes in the design of a fighter plane . . . and there isn't a day dream in the crowd. But they are wasting time—valuable time which could be saved with the Ozalid Process.

With an Ozalid whiteprint machine they could make transparent prints of the original drawings . . . apply Ozalid Corrector Fluid to the obsolete lines and then draw in the new designs. Thus, they could have new "originals" without tedious retracing . . . without the wasteful tie-ups encountered in altering Van Dykes.

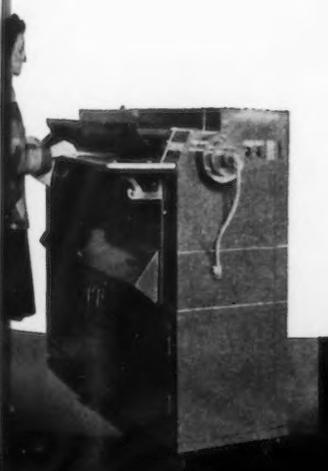
Ozalid transparent and standard whiteprints are produced in two quick steps—*Exposure and Dry Development*. And because of DRY DEVELOPMENT—an Ozalid whiteprint machine is radically different from blue print equipment which requires liquid baths, driers, permanent plumbing connections and much floor space.

Ozalid's wide variety of sensitized materials may be used in the whiteprint machines built for major, medium or small print production—thus, everyone can produce prints on foil, cloth, or air mail weight paper—prints which will have blue, black, maroon or sepia lines on a white background.

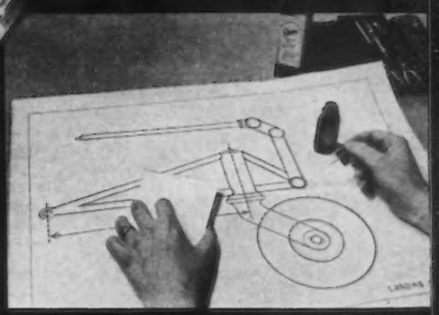
If you are not already using the Ozalid Process . . . but are changing the design of your drawings . . . you are wasting time and labor. Save these essentials in war production!

Write for new catalog "Simplified Printmaking" which explains all the advantages of the Ozalid Process.

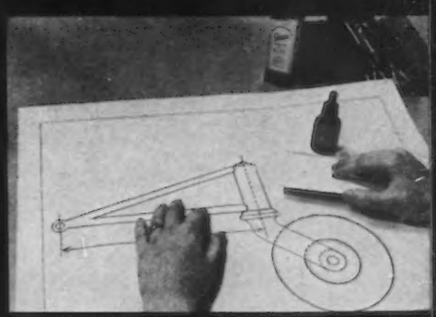
SPECIFY Ozalid WHITEPRINTS



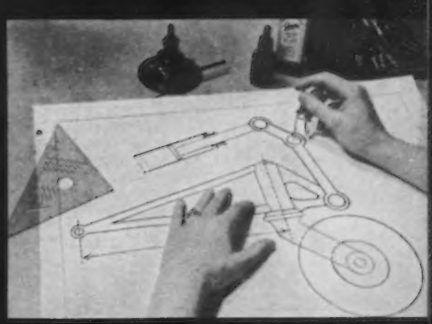
OZALID MODEL "F"



This is an Ozalid transparent print of an original tracing. The draftsman is applying corrector fluid to that part of the design which is to be changed.



The lines are quickly eradicated . . . and the print is dried with a desk blotter. Only that part which will be the same in the "new" design remains.



The changes are drawn in . . . and a "new" original is ready to produce subsequent prints.

OZALID PRODUCTS DIVISION
GENERAL ANILINE & FILM CORPORATION
JOHNSON CITY, N. Y.
OZALID IN CANADA - HUGHES OWENS CO. LTD., MONTREAL

SEMI-FINISHED STEEL

For exceptions, see preceding page

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are $2.25 higher; f.o.b. Duluth, billets only, $2 higher.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00
Alloy Steel: Pittsburgh, Chicago, Canton, Massillon, Buffalo, or Bethlehem, per gross ton	$54.00

Shell Steel

	Per Gross Ton
3 in. to 12 in.	$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Basic open hearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.

Prices delivered Detroit are $2.25 higher.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Lb.
Pittsburgh, Chicago, Cleveland	2.00c.
Worcester, Mass.	2.10c.
Birmingham	2.00c.
San Francisco	2.50c.
Galveston	2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse)

	Base per lb.
High speed	67c.
Straight molybdenum	54c.
Tungsten-molybdenum	57½c.
High-carbon-chromium	43c.
Oil hardening	24c.
Special carbon	22c.
Extra carbon	18c.
Regular carbon	14c.

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi, 3c. higher.

CORROSION AND HEAT-RESISTING STEEL

(Per lb. base price, f.o.b. Pittsburgh)

Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F.Billets	15.725c.	16.15c.	19.125c.	23.375c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hotstrip	17.00c.	17.50c.	24.00c.	35.00c.
Cold st.	22.00c.	22.50c.	32.00c.	52.00c.

Chromium-Nickel Clad Steel (20%)

	No. 304
Plates	18.00c.*
Sheets	19.00c.

*Includes annealing and pickling.

NATIONAL EMERGENCY STEELS (Hot Rolled)

Extras for Alloy Content

Designation	CHEMICAL COMPOSITION LIMITS, PER CENT								Basic Open-Hearth		Electric Furnace	
	Carbon	Manganese	Phosphorus Max.	Sulphur Max.	Silicon	Chromium	Nickel	Molybdenum	Bars and Bar Strip	Billets, Blooms and Slabs	Bars and Bar Strip	Billets, Blooms and Slabs
NE 1330	.28/.33	1.60/1.90	.040	.040	.20/.35				.10c	$2.00		
NE 1335	.33/.38	1.60/1.90	.040	.040	.20/.35				.10	2.00		
NE 1340	.38/.43	1.60/1.90	.040	.040	.20/.35				.10	2.00		
NE 1345	.43/.48	1.60/1.90	.040	.040	.20/.35				.10	2.00		
NE 1350	.48/.53	1.60/1.90	.040	.040	.20/.35				.10	2.00		
NE 8020	.18/.23	1.00/1.30	.040	.040	.20/.35			.10/.20	.45	9.00	.95c	$19.00
NE 8022	.20/.25	1.00/1.30	.040	.040	.20/.35			.10/.20	.45	9.00	.95	19.00
NE 8339	.37/.42	1.30/1.60	.040	.040	.20/.35			.20/.30	.75	15.00	1.25	25.00
NE 8442*	.40/.45	1.30/1.60	.040	.040	.20/.35			.30/.40	.90	18.00	1.40	28.00
NE 8613	.12/.17	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.15/.25	.75	15.00	1.25	25.00
NE 8615	.13/.18	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.15/.25	.75	15.00	1.25	25.00
NE 8617	.15/.20	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.15/.25	.75	15.00	1.25	25.00
NE 8620	.18/.23	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.15/.25	.75	15.00	1.25	25.00
NE 8630	.28/.33	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.15/.25	.75	15.00	1.25	25.00
NE 8715	.13/.18	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8720	.18/.23	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8722	.20/.25	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8735	.33/.38	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8739	.35/.40	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8740	.38/.43	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8744	.40/.45	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8749	.45/.50	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8949*	.45/.50	1.00/1.30	.040	.040	.20/.35	.40/.60	.40/.60	.30/.40	1.20	24.00	1.70	34.00
NE 9255	.50/.60	.70/.95	.040	.040	1.80/2.20				.40c	8.00		
NE 9260	.55/.65	.75/1.00	.040	.040	1.80/2.20				.40	8.00		
NE 9262	.55/.65	.75/1.00	.040	.040	1.80/2.20	.20/.40			.65	13.00		
NE 9415	.13/.18	.80/1.10	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30c	$26.00
NE 9420	.18/.23	.80/1.10	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30	26.00
NE 9422	.20/.25	.80/1.10	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30	26.00
NE 9430	.28/.33	.90/1.20	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30	26.00
NE 9435	.33/.38	.90/1.20	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30	26.00
NE 9437	.35/.40	.90/1.20	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30	26.00
NE 9440	.38/.43	.90/1.20	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30	26.00
NE 9442	.40/.45	1.00/1.30	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.85	17.00	1.35	27.00
NE 9445	.43/.48	1.00/1.30	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.85	17.00	1.35	27.00
NE 9450	.48/.53	1.20/1.50	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.85	17.00	1.35	27.00
NE 9537*	.35/.40	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.60	.15/.25	1.20	24.00	1.70	34.00
NE 9540*	.38/.43	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.60	.15/.25	1.20	24.00	1.70	34.00
NE 9542*	.40/.45	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.60	.15/.25	1.20	24.00	1.70	34.00
NE 9550*	.48/.53	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.60	.15/.25	1.20	24.00	1.70	34.00
NE 9630	.28/.33	1.20/1.50	.040	.040	.40/.60	.40/.60			.80	16.00	1.30	26.00
NE 9635	.33/.38	1.20/1.50	.040	.040	.40/.60	.40/.60			.80	16.00	1.30	26.00
NE 9637	.35/.40	1.20/1.50	.040	.040	.40/.60	.40/.60			.80	16.00	1.30	26.00
NE 9640	.38/.43	1.20/1.50	.040	.040	.40/.60	.40/.60			.80	16.00	1.30	26.00
NE 9642	.40/.45	1.30/1.60	.040	.040	.40/.60	.40/.60			.85	17.00	1.35	27.00
NE 9645	.43/.48	1.30/1.60	.040	.040	.40/.60	.40/.60			.85	17.00	1.35	27.00
NE 9650	.48/.53	1.30/1.60	.040	.040	.40/.60	.40/.60			.85	17.00	1.35	27.00

***Recommended for large sections only.**

Note: The extras shown above are in addition to a base price of 2.70c. per 100 lb., on finished products and $54 per gross ton on semi-finished steel major basing points and are in cents per 100 lb. and dollars per gross ton in semi-finished.

ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh)

	Per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

F.o.b. Granite City, add 10c. per 100 lb. on field grade to and including dynamo. Pacific ports add 75c. per 100 lb. on all grades.

WIRE PRODUCTS

To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham

	Base per Keg
Standard wire nails	$2.55
Coated nails	2.55
Cutnails, carloads	3.85
	Base per 100 Lb.
Annealed fence wire	$3.05
Annealed galvanized fence wire	3.40
	Base Column
Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	59
Galvanized barbed wire†	70
Twisted barbless wire	70

*15½ gage and heavier. †On 80-rod spools in carload quantities.

RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., gross ton	$40.00
Angle bars, 100 lb.	2.70
(F.o.b. Basing Points)	*Per Gross Ton*
Light rails (from billets)	$40.00
Light rails (from rail steel)	39.00
	Base per Lb.
Cut spikes	3.00c.
Screw spikes	5.15c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast	2.30c.
Track bolts	4.75c.
Track bolts, heat treated, to railroads	5.00c.
Track bolts, jobbers discount	63-5

Basing Points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond.

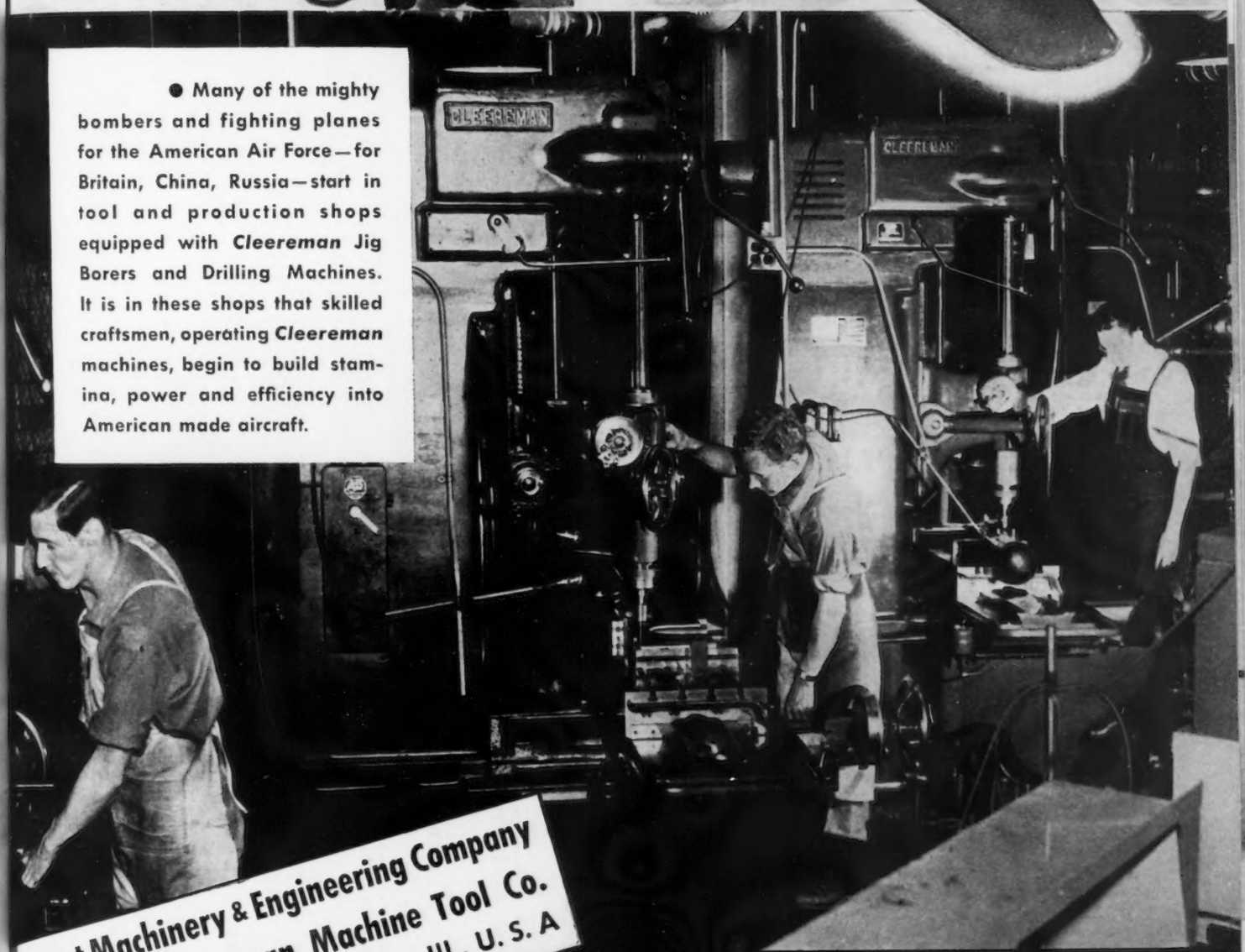
ROOFING TERNE PLATE

(F.o.b. Pittsburgh, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	$6.00	$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00

BOMBERS *start from here*

● Many of the mighty bombers and fighting planes for the American Air Force—for Britain, China, Russia—start in tool and production shops equipped with ***Cleereman*** Jig Borers and Drilling Machines. It is in these shops that skilled craftsmen, operating ***Cleereman*** machines, begin to build stamina, power and efficiency into American made aircraft.



Bryant Machinery & Engineering Company
Sales Division of **Cleereman Machine Tool Co.**
400 W. Madison St. • Chicago, Ill., U. S. A

CLEEREMAN

DRILLING MACHINES and JIG BORERS

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts:

	Per Cent off List
½ in. & smaller x 6 in. & shorter	65½
9/16 & ⅝ in. x 6 in. & shorter	63½
¾ to 1 in. x 6 in. & shorter	61
1⅛ in. and larger, all length	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed:

(Hexagon or Square)

½ in. and smaller	62
9/16 to 1 in. inclusive	59
1⅛ to 1½ in. inclusive	57
1⅝ in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	S.A.E.
7/16 in. and smaller		64
½ in. and smaller	62	..
½ in. through 1 in.	..	60
9/16 to 1 in.	59	..
1⅛ in. through 1½ in.	57	58
1⅝ in. and larger	56	..

In full container lots, 10 per cent additional discount.

Stove Bolts

Packages, nuts loose	71 and 10
In packages, with nuts attached	71
In bulk	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York on lots of 200 lb. or over.

Large Rivets *(½ in. and larger)*

	Base per 100 lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$3.75

Small Rivets *(7/16 in. and smaller)*

	Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 5

Cap and Set Screws *Per Cent Off List*

Upset full fin. hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes	36
Filister head cap, listed sizes	51

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices (in italics) are delivered quotations per gross ton computed on the basis of the official maxima

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorus	Charcoal
Boston††	***$25.53***	***$25.03***	***$26.53***	***$26.03***	.....	.....
Brooklyn	***27.65***	.....	.....	***28.15***	.....	.....
Jersey City	***26.62***	***26.12***	***27.62***	***27.12***	.....	.....
Philadelphia	***25.89***	***25.39***	***26.89***	***26.39***	.....	.....
Bethlehem, Pa.	$25.00	$24.50	$26.00	$25.50	.....	.....
Everett, Mass.††	25.00	24.50	26.00	25.50	.....	.....
Swedeland, Pa.	25.00	24.50	26.00	25.50	.....	.....
Steelton, Pa.	.....	24.50	.....	.....	$29.50	.....
Birdsboro, Pa.	25.00	24.50	26.00	25.50	29.50	.....
Sparrows Point, Md.	25.00	24.50	.....	.....	.....	.....
Erie, Pa.	24.00	23.50	25.00	24.50	.....	.....
Neville Island, Pa.	24.00	23.50	24.50	24.00	.....	.....
Sharpsville, Pa.*	24.00	23.50	24.50	24.00	.....	.....
Buffalo	24.00	23.00	25.00	24.50	29.50	.....
Cincinnati	***24.68***	***24.68***	.....	***25.18***	.....	.....
Canton, Ohio	***25.47***	***24.97***	***25.97***	***25.47***	.....	.....
Mansfield, Ohio	***26.06***	***25.56***	***26.56***	***26.06***	.....	.....
St. Louis	***24.50***	***24.00***	.....	.....	.....	.....
Chicago	24.00	23.50	24.50	24.00	.....	***$31.34***
Granite City, Ill.	24.00	23.50	24.50	24.00	.....	.....
Cleveland	24.00	23.50	24.50	24.00	.....	.....
Hamilton, Ohio	24.00	23.50	.....	24.00	.....	.....
Toledo	24.00	23.50	24.50	24.00	.....	.....
Youngstown*	24.00	23.50	24.50	24.00	.....	.....
Detroit	24.00	23.50	24.50	24.00	.....	.....
Lake Superior fc.	.....	.....	.....	.....	.....	$28.00
Lyles, Tenn. fc.†	.....	.....	.....	.....	.....	33.00
St. Paul	***26.76***	.....	***27.26***	***26.76***	.....	.....
Duluth	24.50	.....	25.00	24.50	.....	.....
Birmingham	20.38	19.00	25.00	.....	.....	.....
Los Angeles	***27.25***	.....	.....	.....	.....	.....
San Francisco	***27.25***	.....	.....	.....	.....	.....
Seattle	***27.25***	.....	.....	.....	.....	.....
Provo, Utah	22.00	.....	.....	.....	.....	.....
Montreal	***27.50***	***27.50***	.....	***28.00***	.....	.....
Toronto	***25.50***	***25.50***	.....	***26.00***	.....	.....

GRAY FORGE IRON: Valley or Pittsburgh furnace $23.50

*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

**Pittsburgh Ferromanganese Co. (Chester furnace only) may charge $2.25 a ton over maximum basing point prices.

†Price shown is for low-phosphorous iron; high-phosphorous sells for $28.50 at the furnace.

††Eastern Gas & Fuel Associates, Boston, is permitted to sell pig iron produced by its selling company, Mystic Iron Works, Everett, Mass., at $1 per gross ton above maximum prices.

Delta Chemical & Iron Co., Chicago, may charge $30 for charcoal iron at its Delta, Mich., furnace.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 per cent to 2.25 per cent); phosphorous differentials, a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over; manganese differentials, a charge not to exceed 50c. per ton for each 0.50 per cent manganese content in excess of 1.00 per cent.

WAREHOUSE PRICES

(Delivered Metropolitan areas, per 100 lb. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. City prices are used in conformance with OPA Schedule 49)

CITIES	SHEETS			STRIP		Plates (¼ in. and heavier)	Structural Shapes	BARS			ALLOY BARS		
	Hot Rolled (10 ga.)	Cold Rolled	Galv. (24 ga.)	Hot Rolled	Cold Rolled			Hot Rolled	Cold Finished	Hot Rolled 2300	Hot Rolled 3100	Cold Drawn 2300	Cold Drawn 3100
Pittsburgh	$3.35	....	$4.65	$3.60	$3.20	$3.40	$3.40	$3.35	$3.65	$7.45	$5.75	$8.40	$6.75
Chicago	3.25	$4.10	4.85[1]	3.60	3.50	3.55	3.55	3.50	3.75	7.35	5.65	8.40	6.75
Cleveland	3.35	4.05	4.62	3.50	3.20	3.40	3.58	3.25	3.75	7.55	5.85	8.40	6.75
Philadelphia	3.55	4.05[5]	4.65	3.51	3.31	3.55	3.55	3.85	4.06	7.31	5.86	8.56	7.18
New York	3.58	4.60[2]	5.00	3.96[6]	3.51	3.76	3.75	3.84	4.09	7.60	5.90	8.84	7.19
Detroit	3.43	4.30	4.84[1]	3.68*	3.40	3.60	3.65	3.43	3.80	7.67	5.97	8.70	7.05
Buffalo	3.25	4.30[1]	4.75[4]	3.82	3.52	3.62	3.40	3.35	3.75	7.35	5.65	8.40	6.75
Boston	3.71	4.68	5.11	4.06	3.46	3.85	3.85	3.98	4.13	7.75	6.05	8.88	7.23
Birmingham	3.45[3]	....	4.75[1]	3.70[3]	....	3.55[3]	3.55[3]	3.50[3]	4.48	....	....	....	....
St. Louis	3.39	4.24[2]	4.99[1]	3.74	3.61	3.69	3.69	3.64	4.02	7.72	6.02	8.77	7.12
St. Paul	3.50	4.35	5.00	3.85	3.83	3.80	3.80	3.75	4.34	7.45	6.00	8.84	7.44
Milwaukee	3.38	4.23[2]	4.98[1]	3.73	3.54	3.68	3.68	3.63	3.88	7.58	5.88	8.63	6.98
Baltimore	3.50	....	5.05	4.00	....	3.70	3.70	3.85	4.04	....	....	....	....
Cincinnati	3.42	4.37[2]	4.42[1]	3.67	3.45	3.65	3.68	3.60	4.00	7.69	5.99	8.50	7.10
Norfolk	3.85	....	5.40	4.10	....	4.05	4.05	4.00	4.15	....	....	....	....
Washington	3.60	....	....	4.10	....	3.80	3.80	3.95	4.10	....	....	....	....
Indianapolis	3.45	4.25	5.01[1]	3.75	3.28	3.70	3.70	3.60	3.97	7.67	5.97	8.72	7.07
Omaha	3.85	....	5.52[1]	4.20	....	4.15	4.15	4.10	4.42	....	....	....	....
Memphis	3.85	....	5.25	4.10	....	3.95	3.95	3.90	4.31	....	....	....	....
New Orleans	4.05	....	....	4.30	....	3.90	3.90	4.10	4.60	....	....	....	....
Houston	4.00	....	....	4.30	....	4.05	4.05	3.75	....	....	....	....	....
Los Angeles†	4.95	7.15	5.95	4.90	....	4.90	4.60	4.35	6.60	9.55	8.55	10.55	9.55
San Francisco†	4.55	7.05	6.10	4.50	....	4.65	4.35	3.95	6.80	9.80	8.80	10.80	9.80
Seattle†	4.65[7]	....	5.70[7]	4.25	....	4.75	4.45	4.20	5.75	....	8.00	....	....

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb., galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: [1] 500 to 1499 lb. [2] 400 to 1499 lb. [3] 400 to 3999 lb. [4] 450 to 1499 lb. [5] 1000 to 1999 lb. [6] 0 to 1999 lb. [7] 300 to 10,000 lb. At Philadelphia galvanized sheets, 25 or more bundles; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; San Francisco, hot rolled sheets, 400 to 39,999 lb., galvanized and cold rolled sheets, 750 to 4999 lb., cold fin. bars, 0-299 lb.; hot rolled alloy bars, 0-4999 lb.; Seattle, cold finished bars, 1000 lb. and over, hot rolled alloy bars, 0-1999 lb.; Memphis, hot rolled sheets, 400 to 1999 lb., galvanized sheets, 150 and over; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lb.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations. * 12 gage and heavier, $3.43. † Los Angeles, San Francisco and Seattle prices reflect special provisions of amendment No. 2 to OPA Price Schedule No. 49.

DREVER

INDUSTRIAL

FURNACES

THE DREVER CO.
780 E. VENANGO ST.
PHILADELPHIA, PA.

BRIGHT ANNEALING
CARBURIZING
HEAT TREATING
ANNEALING

BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes Minimum Wall

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld, Hot Rolled
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2½ in. o.d. 12 B.W.G.	20.21	17.54	16.58
3 in. o.d. 12 B.W.G.	22.48	19.50	18.35
3½ in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66

(Extras for less carload quantities)

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham	46.00
6-in. and larger f.o.b. cars, San Francisco or Los Angeles	69.40
6-in. and larger f.o.b. cars, Seattle	71.20

Class "A" and gas pipe, $3 extra; 4-in. pipe is $3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is $45 at Birmingham and $53.80 delivered Chicago. $59.40 at San Francisco and Los Angeles, and $70.20 at Seattle.

WELDED PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought pipe)
Base Price—$200 per Net Ton

	Black	Galv.
Steel (Butt Weld)		
½ in.	63½	51
¾ in.	66½	55
1 to 3 in.	68½	57½
Wrought Iron (Butt Weld)		
½ in.	25	3½
¾ in.	30	10
1 and 1¼ in.	34	16
1½ in.	38	18½
2 in.	37½	18
Steel (Lap Weld)		
2 in.	61	49½
2½ and 3 in.	64	52½
3½ to 6 in.	66	54½
Wrought Iron (Lap Weld)		
2 in.	30½	12
2½ to 3 ½ in.	31½	14½
4 in.	33½	18
4½ to 8 in.	32½	17
Steel (Butt, extra strong, plain ends)		
½ in.	61½	50½
¾ in.	65½	54½
1 to 3 in.	67	57
Wrought Iron (Same as Above)		
½ in.	25	6
¾ in.	31	12
1 to 2 in.	38	19½
Steel (Lap, extra strong, plain ends)		
2 in.	59	48½
2½ and 3 in.	63	52½
3½ to 6 in.	66½	56
Wrought Iron (Same as Above)		
2 in.	33½	15½
2½ to 4 in.	39	22½
4½ to 6 in.	37½	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher on all butt weld.

Ferroalloys

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans, Domestic, 80%, per gross ton (carloads) $135.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	$36.00
Domestic, 26 to 28%	49.50

Electric Ferrosilicon

(Per Gross Ton, Delivered Lump Size)

50% (carload lots, bulk)	$74.50
50% (ton lots, packed)	87.00
75% (carload lots, bulk)	135.00
75% (ton lots, packed)	151.00

Silvery Iron

(Per Gross Ton, base 6.00 to 6.50 Si)

F.o.b. Jackson, Ohio $29.50*
Buffalo 30.75*

For each additional 0.50% silicon add $1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add $1 a ton for 0.75% phosphorus or over.

*Official OPA price established June 24, 1941.

Bessemer Ferrosilicon

Prices are $1 a ton above Silvery Iron quotations of comparable analysis.

Ferrochrome

(Per Lb., Contained Cr, Delivered Carlots, Lump Size, on Contract)

4 to 6 carbon	13.00c.
2 carbon	19.50c.
1 carbon	20.50c.
0.10 carbon	22.50c.
0.06 carbon	23.00c.

Spot prices are ¼c. per lb. of contained chromium higher.

Silico-Manganese

(Per Gross Ton, Delivered, Carloads, Bulk)

3 carbon	$120.00
2.50 carbon	125.00
2 carbon	130.00
1 carbon	140.00

Other Ferroalloys

Ferrotungsten, per lb. contained W, del'd carload	$2.00
Ferrotungsten, 100 lb. and less	2.25
Ferrovanadium, contract, per lb. contained V, del'd	$2.70 to $2.90†
Ferrocolumbium, per lb. contained Cb, f.o.b. Niagara Falls, N. Y., ton lots	$2.25†
Ferrocarbontitanium, 15-18 Ti, 7-8 C, f.o.b. furnace, carload contract, net ton	$142.50
Ferrocarbontitanium, 17-20 Ti, 3-5 C, f.o.b. furnace, carload contract, net ton	$157.50
Ferrophosphorus, electric or blast furnace materials, carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage freight, equaled with Rockdale, Tenn., gross ton.	$58.50
Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., $3 unitage, freight equalized with Nashville, gross ton	$75.00
Ferromolybdenum, per lb., Mo, f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo, f.o.b. furnace	80c.
Molybdenum oxide briquettes 48-52 Mo, per lb. contained Mo, f.o.b. Langeloth, Pa.	80c.
Molybdenum oxide, in cans, per lb. contained Mo, f.o.b. Langeloth, and Washington, Pa.	80c.

*Spot prices are $5 per ton higher.
†Spot prices are 10c. per lb. of contained element higher.

LAKE SUPERIOR ORES

(51.50% Fe., Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer, 51.50	$4.75
Old range, non-bessemer, 51.50	4.60
Mesaba, bessemer, 51.50	4.60
Mesaba, non-bessemer, 51.50	4.45
High phosphorus, 51.50	4.35

COKE*

Furnace

	Per Net Ton
†Connellsville, prompt	$6.00

Foundry

†Connellsville, prompt	$6.75 to $7.00
By-product, Chicago	$12.25
By-product, New England	$13.75
By-product, Newark	$12.40 to $12.95
By-product, Philadelphia	$12.38
By-product, Cleveland	$12.30
By-product, Cincinnati	$11.75
By-product, Birmingham	$8.50†
By-product, St. Louis	$12.02
By-product, Buffalo	$12.50

*Maximum by-product coke prices established by OPA became effective Oct. 1, 1941. A complete schedule of the ceiling prices was published in THE IRON AGE, Sept. 25, p. 94B. Maximum beehive furnace coke prices established by OPA, Jan. 26. †F.O.B. oven.

Ceiling for operators of hand drawn ovens using trucked coal is $6.50.

FLUORSPAR

	Per Net Ton
Domestic washed gravel, 85-5 f.o.b. Kentucky and Illinois mines, all rail	$25.00
Domestic, f.o.b. Ohio River landing barges	25.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines	25.00

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	Per 1000
Super-duty brick, St. Louis	$64.60
First quality, Penna., Md., Ky., Mo. & Ill.	51.30
First quality, New Jersey	56.00
Second quality, Penna., Md., Ky., Mo. & Ill.	46.55
Second quality, New Jersey	51.00
No. 1, Ohio	43.00
Ground fire clay, net ton	7.60

Silica Brick	
Pennsylvania & Birmingham	$51.30
Chicago District	58.90
Silica cement, net ton (Eastern)	9.00

Chrome Brick	Per Net Ton
Standard or chemically bonded, Balt., Plymouth Meeting and Chester	$54.00

Magnesite Brick	
Standard, Balt. and Chester	$76.00
Chemically bonded, Baltimore	65.00

Grain Magnesite	
Domestic, f.o.b. Balt. and Chester in sacks (carloads)	$44.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00